

# Jocko Lakes Fire Salvage Timber Sales

## Final Environmental Assessment

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Montana Department of Natural Resources and Conservation



Southwestern Land Office

Clearwater Unit

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## 1. Introduction and Overview

In July and August of 2007, the Jocko Lakes fire burned over 36,000 acres of state, federal, private, and tribal land west of Seeley Lake, Montana. Of those acres burned, approximately 2,100 were State of Montana forested school trust lands. In response to this event, the Clearwater Unit of the Montana Department of Natural Resources and Conservation (DNRC) is proposing a commercial timber harvest on State-owned lands within the Jocko Lakes fire area. The proposed harvest would take place in Section 6 and 8 of Township 16 North, Range 15 West and Section 16 of Township 16 North Range 16 West, 2.5 miles and 7 miles west of Seeley Lake respectively (Attachment A, Vicinity Map). Harvested volume from these sections would be sold as several sales or permits.

Under the proposed action, DNRC would harvest approximately 8 to 11 million board feet (MMBF) of dead and dying timber from up to 1,503 acres within Sections 6, 8, and 16. The objectives of the proposed action would be to: 1) mitigate adverse impacts from the fire; 2) restore the forest to its income-generating potential; 3) capture value of dead and dying trees and prevent future value loss; and 4) generate revenue for the trust beneficiaries. An estimated \$1,056,000 to \$1,452,000 in revenue to the Common Schools and M.S.U. 2<sup>nd</sup> Grant Trusts would be generated through the implementation of the proposed action.

In addition to timber harvest, other activities would include road construction, road improvement, road maintenance, and reforestation. Under the proposed action, DNRC would construct approximately 2.75 miles of road and abandon approximately 0.5 miles of existing road all within Section 16. Approximately 0.5 miles of the new road construction would be removed post-harvest. Ongoing road improvement and road maintenance would occur throughout all sections. Reforestation activities would include the planting of appropriate species for the site (western larch, ponderosa pine, and Douglas-fir) in high-severity burned areas. DNRC would continue to assess rehabilitation needs following harvest activities. If the Action Alternative is selected, activities could begin in December 2007.

The lands involved in this proposed project are held by the State of Montana in trust for the Common Schools and M.S.U. 2<sup>nd</sup> Grant (Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X, Section 11). The Board of Land Commissioners and the DNRC are required by law to administer these trust lands to produce the largest measure of reasonable and legitimate return over the long run for the beneficiary institutions (Section 77-1-202, MCA). The DNRC would manage lands involved in this project in accordance with the State Forest Land Management Plan (DNRC 1996) and the Administrative Rules for Forest Management (ARM 36.11.401 through 450) as well as other applicable state and federal laws.

## 2. Project Development

### 2.1. Public Involvement, Agencies, Groups or Individuals Contacted

DNRC mailed scoping letters on September 10, 2007 to adjacent landowners, and known interested parties. A public notice was run in the Missoulian and Seeley Lake Pathfinder Newspapers. Two written comment letters in support of the proposed action were received. DNRC consulted the Montana Natural Heritage Program for information about known species of concern in the area. DNRC specialists were also consulted, including: Jeff Collins, Hydrologist and Soil Scientist; Mike McGrath, Wildlife Biologist, and Patrick Rennie, Archeologist.



## **2.2. Other Governmental Agencies with Jurisdiction**

To access State Sections 6 and 8, Township 16 North Range 15 West, the DNRC would need to obtain a Temporary Road Use Permit (TRUP) to legally travel across Plum Creek Timber Company (PCTC) property in Section 7, Township 16 North Range 15 West.

To access State Section 16, Township 16 North Range 16 West, the DNRC would need to obtain TRUPs from the U.S. Forest Service (USFS) and PCTC to legally travel across Sections 22 and 23, Township 16 North Range 16 West (USFS) and across Section 25, Township 16 North Range 16 West (PCTC).

Slash burning would be done in compliance with statewide cooperative agreements as well as any local restrictions.

## **2.3. Alternatives Considered**

### **No Action**

Under the No Action Alternative, none of the proposed harvest or roadwork would occur at this time. However, roadwork proposed in the Jocko Salvage Roadwork Final EA (DNRC 2007) would continue to take place within Section 6, 8, and 16. With access to the burned area, DNRC would consider future options for salvage and other forest management activities. Other current land use activities, including grazing on Section 8 and the recreational use lease on Section 16, would continue.

### **Action Alternative**

Under the Action Alternative, DNRC would harvest approximately 8 to 11 MMBF of dead and dying timber from 1,503 acres in Sections 6, 8, and 16 (Attachments B and C, Project Area Maps). DNRC would also construct approximately 2.75 miles of road and abandon approximately 0.5 miles of existing road, all within Section 16. Approximately 0.5 miles of the new road construction would be removed post-harvest. Access routes into Section 16 from both the Buck Creek and Finley Creek sides would be gated post-harvest. Road work proposed in the Jocko Salvage Roadwork Final EA (DNRC 2007) would continue to take place within Sections 6, 8, and 16. Reforestation activities would include a combination of natural regeneration and the planting of appropriate species for the site (western larch, ponderosa pine, and Douglas-fir) in severely burned areas. DNRC would continue to assess rehabilitation needs following harvest activities.

Under the Action Alternative, DNRC would also continue current land use activities, including grazing on Section 8 and the recreational use lease on Section 16.

## **3. Impacts on Physical Environment**

### **3.1. Geology and Soils, Watershed, and Fisheries Analysis**

During the initial scoping, no issues were identified by the public regarding potential effects of the proposed action to the soil, watershed and fisheries resources. The following issue statements were developed by the DNRC regarding the potential effects to these resources:

- Timber harvest activities may result in reduced soil productivity and increased erosion due to compaction and displacement, depending on area and degree of harvest effects.



- Timber harvesting and road construction activities may increase sediment delivery into streams and affect water quality.
- Actions related to the proposed timber sale may adversely affect stream temperatures, stream shading, stream sediments and recruitable large woody debris in perennial stream segments of Beaver Creek, and an unnamed drainage of Finley Creek.

### **3.1.1. Geology and Soils**

#### **Geology and Soils Analysis Area**

The analysis area for assessing soil impacts will be the proposed harvest units and roads. This analysis area adequately allows for disclosure of existing conditions and direct, indirect and cumulative impacts. The analysis area is not the entire ownership parcel unless activities are proposed on the entire parcel.

#### **Geology and Soils Analysis Methods**

Following the Jocko Lakes Fire, DNRC resource specialists reviewed the burned areas and proposed harvest units to assess past impacts, burn severity, and hydrophobic (water repellant) soil conditions that may affect erosion and revegetation. We reviewed the proposed new roads to assess suitable locations and existing roads to assess the design of additional drainage mitigations or repairs that would be needed to control erosion.

The methods used for assessing soil resources and disclosing impacts include: compiling and reviewing previous harvest information, studying general soil descriptions, and considering the management implications to soils map units within the project area. The project area was field reviewed to assess past impacts and the recent impacts of the Jocko Lakes Fire and to identify areas with potential for accelerated erosion, compaction and displacement that would require site mitigations. This analysis qualitatively assesses the risk of detrimental effects to soils from erosion, compaction and displacement under each alternative using comparative analysis from previously collected soils monitoring data from over 70 DNRC post harvest monitoring projects (Collins 2004). Assessed in this analysis are the direct and indirect effects of each alternative along with the cumulative effects which consider past, present, and reasonably foreseeable future activities.

#### **EXISTING CONDITIONS - Geology and Soils**

Geology in the Placid Creek drainage and general project area is dominated by thin-bedded Pre-cambrian age sedimentary quartzites and argillites. Bedrock is generally well fractured and rippable where exposed on the ground surface. These bedrock materials typically produce coarse textured soils that are very well drained, with the exception of footslope areas of finer deposition and wetlands. Glacial scouring of ice has exposed bedrock on ridges and some steeper convex slopes. No especially unique or unstable slopes were identified.

The proposed project area is located mainly on gently rolling terrain of glacial till and outwash deposits derived from cobbly sandy loam tills. At higher elevations and on north aspects there is a surface deposit of 4-6" reddish, silt textured loess influenced volcanic ash deposited from the eruption of Mount Mazama in Oregon, approximately 6,700 years ago. Soil map units are derived from the Missoula County Soil Survey and properties are described in Table 3.1-1. Quartzite and argillite bedrock with high rock fragment residual soils occur on the steeper glacially scoured mountain ridges (map units 126,128) and can limit ground based operations. With implementation of BMP's, these rocky soils are well suited to ground based operations on slopes up to 45%.



Primary soils on foot slopes are complexes of Hollandlake gravelly clay loams - Bata and Wildgen gravelly loams - forming in deep glacial till on moderate slopes of 5-30% having a shallow surface deposit of volcanic ash silt. The primary concern is soil displacement and to a lesser degree, compaction which can be mitigated by limits on season of use (Table 3.1-1). Predominate slopes of 10-40% are well suited to ground based skidding operations once soils dry out in the spring.

The mid and upper forest slopes are glacial till covered Wildgen/Winkler gravelly loams and Waldbillig/Holloway gravelly loams. Wildgen gravelly loams occur in glacial till deposits on concave slopes in combination with Winkler soils and have common rock outcrops. Wildgen soils are more productive than Winkler and tend to have higher cobble content in the subsoil. These soils are excessively well drained and droughty which can lead to plant mortality and difficulty to revegetate cutslopes on south slopes. The primary soils concern is avoiding displacement. Erosion hazard is moderate due to the high gravel contents. Waldbillig/Holloway gravelly loams have volcanic ash influenced surface soils on Holloway that increase productivity. Erosion risk can be effectively controlled with standard drainage practices.

Narrow alluvial deposits occur along stream bottoms and wetlands. These alluvial deposits are somewhat poorly drained and seasonally wet supporting riparian species (willow, dogwood and some spruce). The complex terrain and narrowness of some wet areas require site specific review for design of Wetland Management Zones (WMZ's), Streamside Management Zones (SMZ's) and mitigation measures.



**Table 3.1-1**

Soil Interpretations Table 3.1-1 Double Beaver Project Area Section 6, T16N, R15W & N ½ Section 8, T16N, R15W, Buck Finley Project Area Section 16, T16N, R15W						
Map Unit	Mapping Unit Name	Soil Description	Erosion Potential	Displacement hazard	Compaction Hazard	Notes
6	Aquolls and Aquepts, poorly drained	Deep organic silts	Mod	Ruts Easily	Severe when wet	Mark & maintain wetland/SMZ zone as field verified
54	Hollandlake-Bata complex, 4 to 30 % slopes	Deep Loamy till / colluvium & Volcanic ash Surface	Low / Mod	Mod , Ruts easily	Severe when wet	Moist productive soil, Bata has ash surface. Avoid displacement by season of use skid trail planning
55	Hollandlake-Bata complex, 30 to 60 % slopes	Loamy till/colluvium & Volcanic ash Surface	Mod to high on slopes >45% Close drain spacing	Mod to high on slopes >45%	Mod	Mod depth soils, road construction may hit rock. Limit ground skid to slopes less than 45%
115	Waldbillig gravelly silt loam, 4 to 30 % slopes	Glacial till & volcanic ash	Low / Mod	Mod	Severe when wet	Average season of use, check moisture
124	Wildgen gravelly loam, 4 to 30 % slopes	Deep Glacial Till	Low / Mod	Mod	Mod	Average season of use, check moisture
125	Wildgen-Winkler, cool, gravelly loams, 15 to 30 % slopes	Deep Glacial till & colluvium	Mod	Mod	Mod	Moist productive soil Average season of use, check moisture
126	Wildgen-Winkler, cool, gravelly loams, 30 to 60 % slopes	Glacial till & colluvium	Mod to high on slopes >45%	Mod to high on slopes >45%	Mod	Mod to shallow soils, road construction may hit rock. Limit ground skid to slopes less than 45%
128	Wildgen, dry-Winkler complex, 30 to 60 % slopes	Glacial till & colluvium	Mod to high on slopes >45%	Mod to high on slopes >45%	Low	Dry site, Rock limits roads, planting. Long season of use Limit ground skid to slopes less than 45%
129	Windfall gravelly loam, 4 to 30 % slopes	Glacial till & colluvium	Low / Mod	Mod	Low	Dry site, .Long season of use





### DOUBLE BEAVER PROJECT AREAS SOILS MAP AND BURN SEVERITY

This map displays the Double Beaver Project Areas, overlaid on a Soils Map Units and Burn Severity map. The project areas are outlined in black. The burn severity is color-coded: Unburn/Low (green), Low Severity (yellow), Moderate Severity (orange), and High Severity (red). The soils map units are labeled with numbers such as 117, 112, 138, 110, 54, 55, 125, 128, 124, 115, 6, 129, 136, 118, 119, and 125. A legend on the left defines the symbols for the project area, soil map units, and burn severity levels. A scale bar at the bottom indicates distances from 0 to 0.8 miles, and a north arrow is located near the bottom center.

**Legend**

- DBeaverProject\_Area
- Soil Map Units
- Burn Severity**
  - Unburn/Low
  - Low Severity
  - Moderate Severity
  - High Severity

Scale: 0 0.1 0.2 0.4 0.6 0.8 Miles

North Arrow

### BUCK-FINLEY PROJECT AREAS SOILS MAP AND BURN SEVERITY

Section 16, T16N, R16W

**Legend**

- Soil Map Units
- Placid\_bar**
- Burn Severity**
  - Unburn/Low
  - Low Severity
  - Moderate Severity
  - High Severity
- Buck\_Finn\_WS

0 0.15 0.3 0.6 0.9 1.2 Miles

### Soil conditions resulting from the Jocko Lakes Fire

The Jocko Lakes fire burned over 36,000 acres of land in August and September of 2007 including approximately 2,100 acres of DNRC lands managed by the Clearwater Unit. A large part of the fire is characterized by moderate intensity burn where there is a mosaic of mixed green canopy with included areas of complete canopy loss (high intensity). In general, most areas burned with enough heat intensity to kill or weaken most trees, although locations with sparse fuels or near moist riparian and wetland sites experienced varying tree mortality rates between species. For this assessment, *burn intensity* refers to the degree of vegetation burned or lost while *burn severity* refers to the degree of soils duff lost (intact to grey ash). Burn severity can affect water runoff, roots and soil microbes. Refer to soils maps (Figures 3.1-1, 3.1-2 & Table 3.1-2) to compare the distribution of burn severity in the project areas.

**Table 3.1-2** Estimated Burn Severity of Project Area (Within Fire Containment Line)

Burn Severity	Section 6	Section 8	Section 16
Unburned	8%	14%	11%
Low	16%	51%	14%
Moderate	16%	29%	39%
High	61%	6%	36%

Low severity burn occurs where the surface duff is scorched, but not consumed and seeds and roots are intact for rapid re-growth. Moderate severity burn results in some plant root loss and limited effects of water repellency, usually short term. High severity burn occurs where surface litter, duff and seeds are consumed, mineral soil is exposed, erosion hazard increases and surface roots may be killed. Compared to the overall fire, forest stands in DNRC Section 6 experienced a higher proportion of high severity burning that resulted in nearly all tree mortality, loss of canopy and loss of forest soil duff and litter.

In addition to loss of soil cover, another potential effect to soils from fire is hydrophobicity, the tendency for soils to repel water. Soil hydrophobicity can manifest in two different types of soil conditions. One type (type 1) results from high surface tension due to severe drought or an oven drying effect of fires, where soil particles are slow to absorb moisture. This oven-dried soil effect typically dissipates with light rains and frost action over winter. A longer term, second type (type 2) of hydrophobic soil condition is caused by fire altering surface soils with burned resins from duff that seals soil pores and reduces water infiltration. This type of hydrophobicity may last into the next year and can result in flashy, increased runoff and erosion during intense storms.

Field observations of the burned project area found principally the oven-dried effect (type 1) of moderate water repellency on an estimated 25 to 40% of the high severity burned areas. Localized areas of type 2 burn severity was found only in a few locations, and was not continuous in nature.

The fall rains have begun to break down the moderate hydrophobicity allowing soil infiltration of precipitation. The Jocko Lakes fire, although intense in areas, caused only localized long term hydrophobicity that is likely to dissipate within the coming year.

The potential for erosion and surface runoff will increase on all bare soils and is expected to be naturally high in 2008 until the soil surface has vegetative cover. On most moderately



burned sites, conifer needle fall following the fire has covered the soil surface adding to surface protection. Areas of low and moderate burn are expected to revegetate quickly and provide cover from erosion. Erosion will be highest on sites that experienced high severity burning, where forest canopy and the surface soil litter was consumed. Areas of erosion concern are steeper slopes with severe burn in section 6, T16N R15W and the southeast corner of section 16, T16N R16W. Some historic skid trails used over 40 years ago were poorly located and may concentrate surface runoff and erosion. Erosion is expected to be mainly sheet erosion and within the range of historic conditions, unless an intense storm event occurs. Erosion will decline as litter (branches, trees, twigs, needles, etc.) and its subsequent mulching effect along with revegetation increases, thereby providing greater surface soil protection.

Fire suppression activities may also impact soil resources. Several control lines were constructed by bulldozers that scraped through surface soils. These areas have been rehabilitated by recontouring the sites and covering the disturbed area with woody debris and grass seeding, along with constructing features to reduce the potential for soil erosion.

### **Past Management**

Prior management activities occurred on all parcels in the project area. The following Table 3.1-3 summarizes the impacts by parcel.

**Table 3.1-3: Management Impacts from Previous Entries**

<b>Parcel Name/Legal</b>	<b>Description of Past Management</b>	<b>Existing Impacts from Mgmt Activities</b>
Double Beaver Parcel Section 6, T16N, R15W	Portions of the section were logged over 40 years ago and a shelterwood harvest was completed in 1990 and included winter harvest.	Field review indicates limited impacts from past entries. Skid trails were well spaced and are estimated to cover less than 10% of the area. Previous winter harvest.
Double Arrow Parcel N ½ Section 8, T16N, R15W	This section was harvested in early 1990's with the Double Arrow timber sale.	This is very rocky tolerant ground with average soils impacts of less than 10% of the area and no BMP departures from previous harvest.
Buck-Finley Parcel Sec 16, T16N, R16W	This area was last harvested in 1991 with the Finley Creek Timber Sale. Harvest was 1.8 mmbf of seedtree and overstory removal from 220 acres. Additional harvest entries occurred probably in the early 1960's.	During field review, excavated skid trails were identified in portions of this section that may concentrate runoff. Soil productivity in this unit has been affected by the presence of these old 1960 era trails which occur approximately every 75 feet. 150 ft of road was relocated for erosion control. The shelterwood stands were well stocked.

### **Cumulative Soil Effects**

Cumulative effects to soils can occur from repeated ground skidding entries into the harvest area and additional road construction, depending on the area involved. Historic harvest effects are minimal based on previous winter harvest operations and field review for ruts and compaction, which occur on less than 10% of the harvest units and presents low risk of cumulative effects to soils.

## **ENVIRONMENTAL EFFECTS- Geology and Soils**

### **Description of Alternatives**

#### **No Action**

Under the No Action Alternative, no timber harvest would occur. Culverts at risk of flooding would be replaced prior to winter to improve flow capacity. The effects of the No Action Alternative would be the same as previously described under existing conditions for water



quality and fisheries, except for the reduced risk of flooding at the culverts that would be replaced prior to winter.

### **Action Alternative**

The proposed timber salvage would harvest dead and dying on up to approximately 1,053 acres on 3 DNRC parcels. Approximately 2.75 miles of new road would be constructed on the Buck Finley parcel and would include approximately 1 mile of road relocation on improved location and ¼ mile of road abandonment. No new stream crossings would be constructed. Approximately 2.9 miles of road would be reconstructed for access on the Beaver Creek parcel as part of a separate Jocko Salvage Roadwork Final EA (DNRC 2007) this fall. Several temporary spurs to landings may be constructed and stabilized after use. All roads would have adequate drainage concurrent with use and BMP's implemented. Maintenance grading would restore adequate drainage in all existing roads to meet BMP's. No salvage harvest is proposed within Streamside Management Zones. Selective harvest may occur in the severe burned wetland of the Beaver Creek Section 6, T16N R15W consistent with Wetland Management Zone rule ARM 36.11.426.

### **Direct and Indirect Effects – Geology and Soils**

#### **No Action**

The effects of the No Action Alternative would be the same as previously described under existing conditions for soils.

#### **Action Alternative**

For the Action Alternative we evaluated the effects of timber harvest and continuing restoration activities of stabilization and seeding. Effects of tractor skidding harvest could cause direct effect of soil disturbance that could result in increased erosion, but not substantially more than severe burned areas not planned for harvest based on implementation of attached mitigation measures. Natural rates of erosion will be high, and there is limited and conflicting research on if erosion rates would be obviously greater with harvest effects (McIver et.al. 2000).

Under the Action Alternative, specific mitigations and BMP's would be implemented to minimize the area and degree of soil effects associated with proposed harvest. There will likely be negligible effects due to ground based harvest on slopes less than 40% based on our proposed mitigation measures. Mitigations include skid trail planning, cable harvest on steeper slopes, and placing drainage and woody debris on trails as needed to control erosion of sensitive sites. The most sensitive soils are found on wet sites and steep slopes in the severe burn areas, which would be avoided or protected with site specific mitigation measures such as directional falling and winchline skidding to favorable ground. The Beaver Creek parcel has the most extensive area of severely burned land and would be harvested primarily in the winter. Winter harvest in the Beaver Creek Section would minimize soils disturbance (typically less than 10% (Collins 2004). Harvest in the Buck-Finley Parcel would happen during summer operations. Ground effects of harvest operations would be closely monitored.

The proposed harvest should have some net benefit to slow runoff and trap erosion by adding slash, twigs and woody debris to the forest floor on burned sites this first winter. Placing coarse woody debris and broken tops on slopes can have some immediate benefit to slow surface water runoff and reduce erosion as observed on other fires (Sula 2000). Portions of the fire-lines and temporary road would be used for ground skidding this fall and then stabilized with a combination of slash, waterbars and reseeding to control erosion. The



proposed harvest would likely have low to moderate risks of impacts to soils based on implementation of the Best Management Practices, mitigations and Forest Management Rules.

## **Cumulative Effects – Geology and Soils**

### **No Action**

The effects of the No Action Alternative would be the same as previously described under existing conditions for soils.

### **Action Alternative**

In order to limit cumulative impacts, existing skid trails would be used if they are properly located and adequately spaced. By reusing existing skid trails and mitigating the direct and indirect effects with soils moisture restrictions, season of use and method of harvest, the risk of unacceptable long-term impacts to soil productivity would be low. On some selected sites, poorly located skid trails would be stabilized and drainage, growth improved compared to No Action.

Cumulative effects would be controlled by limiting the area of adverse soil impacts to less than 15% of harvest units (as recommended by the State Forest Land Management Plan) through implementation of BMPs, skid trail planning on tractor units and limiting operations to dry or frozen conditions. Temporary roads would be stabilized and revegetated and one drainage crossing would be removed for long term stability. Future harvest opportunities would likely use the same road system, skid trails and landing sites to reduce additional cumulative impacts. Large woody debris would be retained for nutrient cycling long-term soil productivity.

### **3.1.2. Watershed and Fisheries Analysis**

This analysis is designed to disclose the existing condition of the hydrologic and fisheries resources and display the anticipated effects that may result from each alternative. This analysis is based on a coarse filter screening approach for watershed evaluation and on-site field review of the contributing areas within the proposed sale area, harvesting, and road construction activities that may increase sediment delivery into streams and affect water quality.

The primary concerns relating to aquatic resources within the analysis area are potential impacts to water quality from sources outside the channel as well as inside the channel. In order to address these issues the following parameters are analyzed by alternative:

- Miles of new road construction and road improvements
- Potential for sediment delivery to streams
- Level of harvest regarding removal of shade and recruitable woody debris near fish-bearing streams

### **Analysis Methods- Watershed**

The methods applied to the project area to evaluate potential direct, indirect and cumulative effects include a field review to look at potential sediment sources from existing and proposed roads along proposed haul routes. Roads were evaluated to determine existing sources of introduced sediment and potential for sediment associated with flooding. In addition, soil types in the project area were reviewed to identify areas prone to sediment delivery.



### **Analysis Methods - Fisheries**

Expected effects to fisheries habitat will be addressed qualitatively using the current conditions as a baseline disclosing the expected changes due to the alternatives proposed. The analysis method for woody debris recruitment will evaluate the potential reduction in available woody debris and shading due to timber harvest activities.

### **Analysis Area- Watershed**

The Jocko lakes fire has burned over 36,000 acres of private, tribal, State and Federal forest lands. The proposed Jocko Lakes Timber Sale project area is located on state trust land within portions of Sections 6 and N1/2 8, T16N R15W, and Section 16 T16N R16W of Missoula County. The DNRC project area is located within the Placid Creek/Owl Creek drainage and a portion of unnamed face drainage (A) that is above the Clearwater River. The Placid Creek/Owl Creek Watershed (HUC 17010203120) is a 3rd order tributary of 62,196 acres in area and is tributary to the Clearwater and Blackfoot Rivers. The unnamed drainage A is discontinuous and is not connected to the Clearwater River. The terrain includes gentle to steep slopes that have been scoured and rounded by glaciation. Elevations range from 4121 ft. near Placid Lake to 6400 ft. in the headwaters of Finley Creek. The DNRC project area is also located within subwatersheds of Beaver Creek and an unnamed, discontinuous tributary of Finley Creek. The analysis area includes the sub watersheds of Beaver creek and an unnamed tributary of Finley Creek both of which are within the Placid Creek/Owl Creek Watershed.

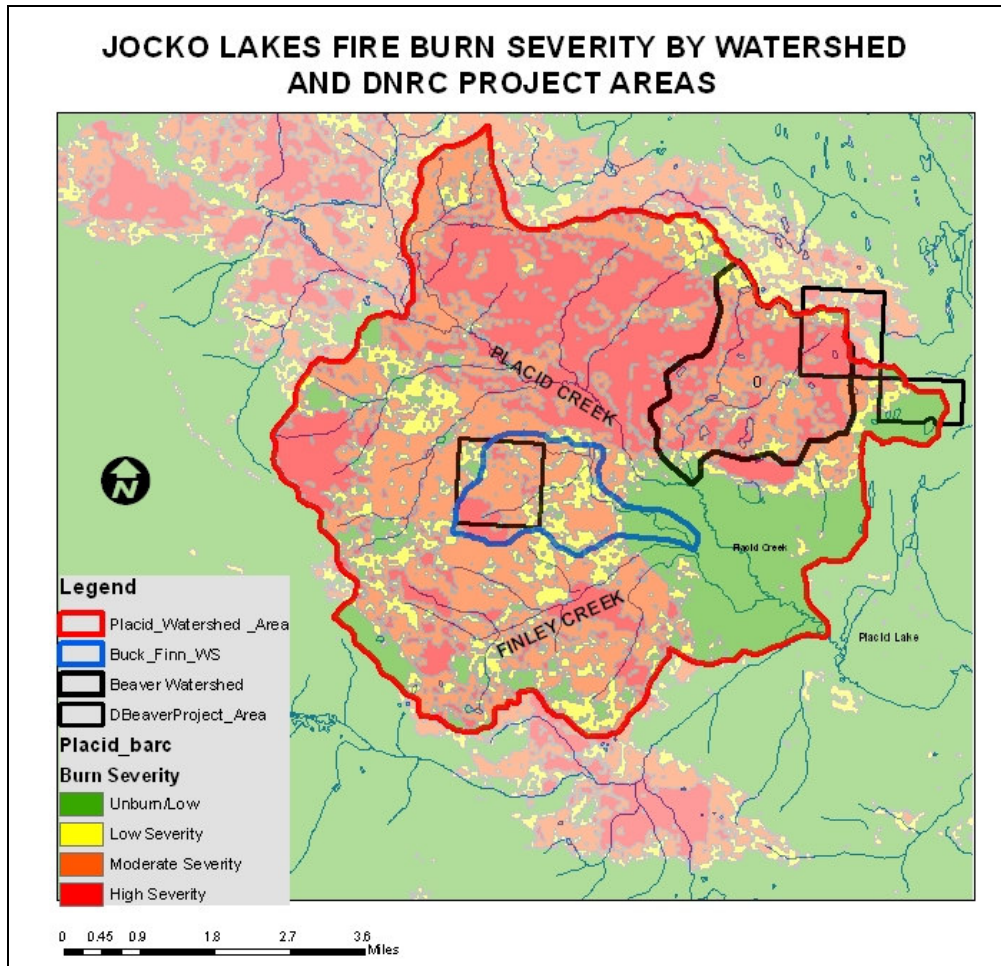
The analysis area for sediment delivery is limited to the harvest units and roads used for hauling. This includes in-channel and upland sources of sediment that could result from this project. In-channel areas include stream channels adjacent to and downstream of harvest areas. Upland harvest units and roads were reviewed for potential sediment delivery as a result of the fire or the proposed action.

### **Analysis Area - Fisheries**

The analysis area for fisheries is the harvest units on DNRC managed land immediately adjacent to fish-bearing streams. This includes harvest units in the Buck-Finley parcel Section 16, T16N R16W. An unnamed discontinuous tributary of Finley Creek originates in Section 16, T16N R16W and may support fish. Field review verified that no fish-bearing streams are present in the Double Creek Section 6, T16N R15W. The N ½ of Section 8, T16N R15W includes Tupper's Lake that supports fish and was stocked in the past. There are no harvest units adjacent to Tupper's lake and no stream connectivity of the project sites that would affect Tupper's Lake.



Figure 3.1-3: Project Watersheds



## **Water Quality Regulations**

The waters contained within the Placid Creek watershed are classified as B-1 by the Montana Surface Water Quality Standards (ARM 17.30.623). The B-1 classification is for waters that are considered suitable for domestic use after conventional treatment, as well as recreation, swimming and bathing. They are also suitable for growth and propagation of salmonid fish and other associated aquatic life, waterfowl, furbearers, agricultural and industrial water supplies. Another criteria for a B-1 classification is; no increases are allowed above naturally occurring concentrations of sediment, settle able solids, oils or floating solids, which will or are likely to create a nuisance or render the waters harmful, detrimental or injurious to public health, recreation, safety, welfare, livestock, wild animals, birds, fish, or other wildlife. Naturally occurring includes conditions or materials present from runoff on developed where all reasonable land, soil and water conservation practices are applied (75-5-306(2) MCA).

## **Water Quality Limited Waterbodies**

Placid Creek, Beaver Creek, and Finley Creek have no pollution related impairments in the DEQ 2006-303(d) listings. Placid Creek supports aquatic life, cold-water fisheries, swimming, and domestic water sources with downstream beneficial uses of agriculture and industry. The 303(d) list is compiled by the Montana Department of Environmental Quality as required by Section 303(d) of the Federal Clean Water Act and the Environmental Protection Agency Water Quality Planning and Management Regulations (40 CFR, Part 130). Under these laws, DEQ is required to identify water bodies that do not fully meet water quality standards, or where beneficial uses are threatened or impaired.

## **Streamside Management Zone Law (SMZ)**

All rules and regulations pertaining to the Streamside Management Zone (SMZ) Law will be followed. An SMZ width of 100 feet is required on Class I and II streams when the slope is greater than 35%. An SMZ width of 50 feet is required when the slope is less than 35%.

## **State Forest Land Management Rules**

All applicable rules and regulations regarding watershed and fisheries management will be followed. This includes but is not limited to water quality (ARM 36.11.422); cumulative effects (36.11.423) Riparian Management Zones (ARM 36.11.425) and Fisheries (ARM 36.11.427).

As part of ARM 36.11.427(3)(a)(i) and (iv) and ARM 36.11.436, DNRC is committed to designing forest management activities to protect and maintain westslope cutthroat trout and all other sensitive fish and aquatic species. DNRC is a signatory to the 2007 (interagency) Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout.

## **Water Rights and Beneficial Users**

Water rights for surface water exist downstream of the project areas on Placid Creek for domestic use, stock watering, industrial use, irrigation, lawn and garden and fire protection.

## **EXISTING CONDITIONS – Watershed and Fisheries**

**Beaver Creek** is a Class I stream in a watershed approximately 2,432 acres in area. DNRC owns approximately 320 acres (13% of watershed) in the northeast portion of the Beaver Creek drainage. The stream flows northeast to southwest into Placid Creek. The drainage headwaters include a large wetland in DNRC Section 6 that has a short segment (~ 200 feet) of perennial, but discontinuous flow, which ends in another wetland. The disconnected





perennial and intermittent conditions of the Beaver Creek headwaters do not support any types of fish habitat in DNRC Section 6. The proposed harvest area contains several isolated wetlands. No wetland impacts were identified from previous harvests.

Beaver Creek begins as a perennial stream approximately ¼ mile below DNRC section Section 6 and meanders through a series of wetlands toward the confluence with Placid Creek. Average precipitation is about 25 inches per year, mostly in the form of snow. Stream channel stability in mid to lower Beaver Creek is considered 'good' primarily due to an the extensive willow/sedge riparian and wetland stream bottom. The Jocko Lakes Fire burned over 90% of the Beaver Creek drainage during August and September 2007. On DNRC managed lands, most vegetation was killed during the fire, and there is an increased risk of erosion on severe burned bare soils. There is one private road segment, about 1/3 mile southwest of the DNRC ownership that parallels Beaver Creek and contributes sediment due to road encroachment on the stream. No other direct sediment sources to Beaver Creek were noted during field reconnaissance; however roads and agricultural use may contribute non-point sediment to Beaver Creek.

Placid Creek and its tributaries, Finley Creek, Lower Beaver Creek and Buck Creek support cold-water fisheries. Fish species include Westslope cutthroat trout, bull trout, rainbow trout, brook trout, kokanee salmon (at Placid Lake), and a number of other species (MFISH 2006 and FWP). Bull trout is a threatened species and Westslope cutthroat trout is a sensitive species. The Double Arrow parcel N ½ Section 8, T16N, R15W includes Tupper's Lake, but there are no fish bearing streams within the timber sale project area or connectivity to Tupper's Lake. Tupper's Lake is fish-bearing, and the current fish status is unknown, but it has not been stocked recently.

**Buck-Finley subwatershed-** An unnamed perennial stream (B) begins as a spring in the Buck-Finley Section 16, T16N, R16W and flows approximately 1 mile northeast to end in a wetland in NE Section 15, T16N, R16W. A seasonal channel flows a short distance from the wetland and goes subsurface in a rocky gorge with no evidence of a channel or connectivity to Finley Creek. The subwatershed is approximately 1,488 acres in area with 12.3 % high, 49.4% moderate and 23.1% low burn severity. Elevations in the section range from 4,600 to 5,600 feet. Within the analysis area, average precipitation is approximately 25 inches a year, which mainly occurs as snow. Runoff is not flashy due to low precipitation, gradients and moderate slopes. There is one perennial stream crossing on DNRC that is considered at risk of flood damage and will be replaced by November 2007 to improve flow capacity, following the wildfire and prior to harvest operations. Five other ephemeral drainage culverts will be replaced to improve capacity and reduce potential for flood damage and sedimentation. The culvert replacements would have minor sediment based on sediment control measures and would improve the existing condition in the short term. High severity burned sites in the southwest corner of the section have several existing poorly located skid trails that could be potential sediment sources if not stabilized and revegetated. Only one minor sediment source was identified at an undersized culvert.

The unnamed stream (B) in Section 16, T 16N, R16W is shallow and narrow, yet may support fish. The northeast corner of the section drains towards Buck Creek. Fish were not observed in the 1 mile perennial stream reach. There is a steep road segment adjacent to the riparian zone that may be at risk of flood damage, although no direct sediment sources were identified. The riparian area below the crossing site experienced less fire severity and tree mortality than adjacent uphill stands.

### **Watershed Cumulative Effects**

Past, current, and future planned activities on all ownerships within each analysis area have been taken into account for the cumulative effects analysis. A coarse filter evaluation of



potential cumulative watershed effects, including watershed conditions and road drainage, was completed as outlined in the Forest Management Rules (ARM 36.11.423). The coarse filter approach consisted of on-site evaluation of harvest areas and roads, and assessing the extent of past harvest activities, through the use of maps and aerial photographs. Considering road effects, the proposed haul routes would use existing forest roads that have been recently graded and will have adequate road drainage installed prior to winter. The access road through the Buck Creek crossing to the northwest of Section 16, T16N, R16W will not be used as a haul route and the connecting road will be closed at the section line. Gate closures will be maintained to prevent unauthorized access and reduce erosion and maintenance. One site of sediment contribution was identified on an old skid trail crossing of a class 3 stream channel that flows in the spring.

Within the fire analysis area, increases in peak seasonal flows, surface runoff, erosion and subsequent sediment delivery, nutrient levels and stream temperatures are anticipated following the recent wildfire. Measurable quantities of these impacts may vary across the fire area and would be dependent on the nature of stream channels, intensity of burned area, local soils, geology, the timing, duration and intensity of snowmelt, and spring rain events. Within the project area sections, both Beaver Creek and the unnamed tributary of Finley Creek have discontinuous flow and do not deliver to other bodies of water. Due to the disconnected nature of these two streams water yield was dismissed from further analysis due to low risk of watershed effects and potential sediment delivery to other bodies of water.

## **ENVIRONMENTAL EFFECTS – Watershed and Fisheries**

### **Description of Alternatives**

#### **No Action**

Under the No Action Alternative, no timber harvest would occur. Culverts at risk of flooding would be replaced prior to winter to improve flow capacity. The effects of the No Action Alternative would be the same as previously described under existing conditions for water quality and fisheries, except for the reduced risk of flooding at the culverts that would be replaced prior to winter.

#### **Action Alternative**

The proposed timber salvage would harvest dead and dying timber on up to approximately 1,053 acres on 3 DNRC parcels. Approximately 2.75 miles of new road would be constructed on the Buck Finley parcel and would include approximately 1 mile of road relocation on improved location and ¼ mile of road abandonment. No new stream crossings would be constructed. Approximately 2.9 miles of road would be reconstructed for access on the Beaver Creek parcel as part of a separate Jocko Salvage Roadwork Final EA (DNRC 2007) this fall. Several temporary spurs to landings may be constructed and stabilized after use. All roads would have adequate drainage concurrent with use and BMP's implemented. Maintenance grading would restore adequate drainage in all existing roads to meet BMP's. No salvage harvest is proposed within Streamside Management Zones. Selective harvest may occur in the severe burned wetland of the Beaver Creek Section 6, T16N R15W consistent with Wetland Management Zone rule ARM 36.11.426.

### **Direct and Indirect Effects – Watershed**

#### **No Action - Watershed**



Under the No Action Alternative, the potential sediment sources on severe burned sites and mainly on steeper slopes would remain with continued risk of sediment delivery to ephemeral draws, streams and wetlands. Continued direct effects on water quality are inadequate road drainage and sedimentation on segments of existing access road right of ways. The highest risk of sediment delivery would occur if intense precipitation or rain on snow events occurred prior to vegetative cover, that could result in erosion of ephemeral draws and stream channels. Over the next several years, fire-killed trees will likely fall into the riparian zone and may cause debris jams that result in increased natural channel scour. The likelihood of debris jams and minor flooding would apply to both the No Action and Action Alternatives. Culvert replacements this fall will help improve storm flow passage at stream crossing sites.

#### **Action Alternative - Watershed**

Under the Action Alternative, road drainage would be improved and maintained to reduce the potential for sediment contribution near streams. One road would be relocated out of the SMZ and several legacy roads in poor locations would be closed, stabilized and reseeded to reduce erosion. Larger culvert sizes would be installed to help pass most flood waters and reduce the chance of debris blockage. No new stream crossings would be constructed that would present potential sediment sources. DNRC's road access route would not use the main Beaver Creek road below the state Section 6, T16N R15W and the haul route would not affect current or future sediment associated with the Beaver Creek road. Road drainage will be improved by November 2007 to reduce erosion and potential flood damage on forest roads. In addition, approximately ¼ mile of road would be relocated to replace a steep poorly drained road that will be stabilized and abandoned. BMP's and Forest Management Rules would be implemented with mitigation measures to control erosion/sedimentation and protect water quality. Timber harvest and ground skidding operations would install adequate drainage in skid trails to reduce the concentration of surface runoff compared to the No Action Alternative. With timber harvest there would be a short term flush of twigs, litter and woody debris distributed on the landscape to help trap sediment and slow runoff. The harvest effects should be similar and not contribute substantially more sediment compared with the expected high natural erosion rates following the Jocko Lakes Fire. The risk of long term adverse direct or indirect effects to water quality would be low with the Action Alternative.

#### **Cumulative Effects – Watershed**

##### **No Action - Watershed**

The Jocko Lakes Fire will likely cause an increase of surface runoff, water yields and on-site surface erosion that may affect stream channel scouring. Under the No Action Alternative, the potential for increased runoff following the fire and to a lesser extent, historic poorly located skid trails and segments of inadequate road drainage would erode and persist similar to existing conditions, until soils are revegetated and protected from erosion and sedimentation. Severely burned areas would have a pulse of sediment the first several years following the fire and then levels would slowly decline as sites stabilized.

##### **Action Alternative - Watershed**

With the Action Alternative, short segments of proposed harvest boundaries would be located adjacent to streams in Beaver Creek and an unnamed stream in the Buck-Finley section. On both sites there is no stream connectivity to Finley or Placid Creek and low risk of stream channel impacts or sediment delivery based on no SMZ harvest and implementation of Best Management Practices, Rules and mitigation measures.



The timber harvest units and new road construction are not located near streams and no riparian harvest is planned. Road surface drainage on haul road systems would be improved and sediment reduced for a net improvement compared to the No Action Alternative. Down gradient beneficial uses would not be affected, as the perennial streams are not connected to first order streams that support beneficial uses. For these reasons, the risk of cumulative effects is low with the proposed action.

### **Direct, Indirect, and Cumulative Effects - Fisheries**

#### **No Action - Fisheries**

The effects of No Action Alternative would be similar to existing conditions with some shading loss from dying trees along the riparian zone of the unnamed stream in the Buck Finley parcel.

#### **Action Alternative – Fisheries**

Only the Buck-Finley parcel has potential resident fish in the lower reaches of stream in the northeast corner of the DNRC section. Most of the riparian zone is intact and no harvest or road construction is planned within the streamside management zone adjacent to this stream. There would be a low risk of adverse effects to riparian stand conditions, stream shading or sediment compared to the No Action Alternative. For these reasons there is low risk of direct, indirect or cumulative impacts to fisheries in the unnamed tributary to Finley Creek, Finley Creek, Beaver Creek or Placid Creek associated with the proposed action alternative.

### **3.1.3. Recommended Mitigation Measures**

Operations conducted in or near wet sites, draw features and on steeper slopes have a higher risk of impacting soil resources. The following mitigation measures would minimize risk of impacts during the proposed harvest activities. The contract administrator would monitor conditions and recommend erosion control as needed.

#### **Road Design Mitigations**

Forestry BMPs would serve as the minimum standard for all operations within the proposed timber sale. Drain dips, grade rolls and other drainage features as would be constructed where necessary and practical to insure adequate road surface drainage. All road surface drainage features would be constructed and maintained concurrent with harvest activities, including road reconstruction and reconditioning. Winter operations on frozen ground may require temporary drainage such as slash, if the road cannot be excavated in winter prior to runoff at the two crossing sites.

Effective sediment filtration (slash) should be used at outlets of drainage features for roads adjacent to streams. Drainage features would be located close enough to the crossing to minimize the runoff contributing area, but at an adequate distance away from the crossing to provide for effective sediment filtering. The outlets of all ditches with direct delivery to streams would be filtered with slash filter windrows, filter fabric or straw bales.

Road use and hauling would be limited to dry, frozen or snow covered conditions. Harvest operations would be suspended when these conditions are not met and certainly before rutting occurs.

All road cuts and fill-slopes where vegetation is not established and any new areas of disturbance associated with road construction would be seeded with site adapted grasses as soon as practical.



Temporary and abandoned roads would have water bars installed, be grass seeded and have slash applied.

Road drainage conditions would be monitored as part of the on-going project operations and repairs would be made as needed, including culvert cleaning and re-vegetation. If cut-slope or fill-slope slumps occurred on existing roads they would be stabilized to control erosion as part of the harvest project.

### **Harvest design Mitigation Measures Skidding Limitations**

Ground-based logging equipment (tractors, skidders, and mechanical harvesters) would be limited to slopes less than 45% on ridges, convex slopes and less than 40% on concave slopes unless ground is frozen.

*Skid Trail Planning* - The logger and sale administrator would agree to a skidding plan prior to equipment operations. Skid trail planning would identify general spacing of trails and preferred locations such as around pothole terrain, and what additional trails or mitigation may be needed. Erosion control would be installed on skid trails and or slashed where needed as directed by the Forest Officer.

*Down Woody Material* - During harvest operations, a minimum of five to ten tons per acre of woody material larger than 3 inches diameter would be left scattered throughout the sale units. A majority of the slash produced would be left within the harvest units or return skidded as required by the Forest Officer. Slash would be returned from the landings, back onto skid trails and into the harvest unit as it is created and well distributed, evenly throughout the unit. Large amounts of slash would not be allowed to accumulate at the landings before it is returned in the unit.

*Season of Use/ Soil Compaction Restrictions* - In order to prevent soil resource impacts, logging activities would be restricted to periods when one or more of the following conditions occurs, unless otherwise approved in writing by the Forest Officer.

- Soil moisture content at 4" depth less than 20% oven dry weight.
- Minimum frost depth of 3".
- Minimum of 12" loose or 6" packed loose adequate to avoid soil displacement.

## **3.2. Air Quality Analysis**

The DNRC is a member of the Montana/Idaho Airshed Group which was formed to minimize or prevent smoke impacts while using fire to accomplish land management objectives and/or fuel hazard reduction (Montana/Idaho Airshed Group 2006). The Group determines the delineation of airsheds and impact zones throughout Idaho and Montana. Airsheds describe those geographical areas that have similar atmospheric conditions, while impact zones describe any area in Montana or Idaho that the Group deems smoke sensitive and/or having an existing air quality problem (Montana/Idaho Airshed Group 2006).

The project area (Sections 6, 8, and 16) is located within Montana Airshed 3B which encompasses portions of Missoula and Powell Counties. Currently, this Airshed does not contain any impact zones. Sections 6 and 8 are located approximately 2.5 west of Seeley Lake and border numerous residential properties, U.S. Forest Service land, and Plum Creek Timber Company land. Section 16 is located approximately 7 miles west of Seeley Lake and borders U.S. Forest Service Land and Plum Creek Timber Company land. Three designated wilderness areas lie 10 to 20 miles north of the project areas: the Mission Mountain Wilderness Area, the Scapegoat Wilderness Area, and the Bob Marshall Wilderness Area. These wilderness areas each exceed 5,000 acres and as such, are considered Federal Class I Areas that ultimately receive protection under the Federal Clean Air Act of 1977.



### **No Action**

Under the No Action Alternative, no harvest activities including slash pile burning and log hauling would take place within the project area. Thus, there would be no effects to air quality within the local vicinity and throughout Airshed 3B.

### **Action Alternative**

Under the Action Alternative, slash piles consisting of tree limbs and tops and other vegetative debris would be created throughout the project area during harvesting. These slash piles would ultimately be burned after harvesting operations have been completed. Burning would introduce particulate matter into the local airshed, temporarily affecting local air quality. Over 70% of emissions emitted from prescribed burning is less than 2.5 microns (National Ambient Air Quality PM 2.5). High, short-term levels of PM 2.5 may be hazardous. Within the typical column of biomass burning, the chemical toxics are: Formaldehyde, Acrolein, Acetaldehyde, 1,4 Butadiene, and Polycyclic Organic Matter.

Under the Action Alternative, burning within the project area would be short in duration and would be conducted when conditions favored good to excellent ventilation and smoke dispersion as determined by the Montana Department of Environmental Quality and the Montana/Idaho Airshed Group. Prior to burning, a "Prescribed Fire Burn Plan" would be completed for the area. The DNRC, as a member of the Montana/Idaho Airshed Group, would burn only on approved days. Thus, direct and indirect effects to air quality due to slash pile burning associated with the proposed action would be minimal.

Burning that may occur on adjacent properties in combination with the proposed action could potentially increase the cumulative effects to the local airshed and the Class I Areas. The Lolo National Forest and Plum Creek Timber Company both participate as Airshed Cooperators and operate under the same Airshed Group guidelines as the DNRC. Thus, cumulative effects to air quality due to slash pile burning associated with the proposed action are also expected to be minimal.

Harvesting and log hauling could create dust which may affect local air quality. Harvesting operations would be short in duration and would occur mostly during the winter months, thereby minimizing dust dispersal. Thus, direct, indirect, and cumulative effects to air quality due to harvesting and hauling associated with the proposed action would be minimal.

### **3.3. Vegetation Analysis**

The Jocko Lakes Salvage project area (Sections 6, 8, and 16) consists primarily of western larch/Douglas-fir, subalpine fir, and ponderosa pine cover types. Prior to the fire, approximately 1,592 acres (99%) of the 1,607 acre project area was forested (Table 3.3-1).

**Table 3.3-1:** Pre-fire Cover Types for the Jocko Lakes Salvage Project Area

Cover Type	Acres	Percent of Area
Subalpine fir	344	21%
Mixed Conifer	77	5%
Lodgepole pine	95	6%
Ponderosa pine	390	24%
Western larch/Douglas-fir	685	43%
Non-commercial	9	1%
Water	7	0%
<b>Total</b>	<b>1,607</b>	<b>100%</b>



At the larger scale, DNRC lands managed by the Clearwater Unit are approximately 85% forested, mostly in the ponderosa pine and western larch/Douglas-fir cover types (Table 3.3-2). This area falls within climatic section 332B, the Bitterroot-Blackfoot, which was historically about 79% forested. Within the climatic section, the historically dominant cover type was lodgepole pine, followed by Douglas-fir and ponderosa pine on lower slopes (Losensky 1997). There are 14 habitat types found within the project area. The most prevalent are those within the moderately cool and dry; the cool and moderately dry; and the cool and moist habitat type groups.

**Table 3.3-2:** Pre-fire Cover Types for the Clearwater Unit

Cover Type	Current Cover Type (Acres)
Douglas-fir	6,860
Mixed Conifer	2,596
Ponderosa pine	16,319
Western larch/Douglas-fir	12,409
Lodgepole	4,343
Subalpine fir	2,956
Hardwood	206
Non-forested	7,093
Noncommercial	703
<b>Total</b>	<b>53,485</b>

Age class distributions in conjunction with other forest stand conditions or characteristics are useful in determining general historic conditions for inferring desired future conditions. Table 3.3-3 displays Pre-fire Age Class Distribution on project area and landscape scales. Stands in the seedling-sapling age class are under-represented compared to the historical condition for both the Clearwater Unit landscape and the project area, and the 40-99 and 100-149 age classes are over-represented. This deviation from historical conditions can partially be explained by successful fire suppression that increased the interval between fires and logging practices that did not necessarily create a similar disturbance to a wildfire.

DNRC has adopted old-growth definitions based on Green et al. (1992). Based on modeling, one 36-acre stand may have met Green et al.'s definition of old-growth because of the number of large live trees prior to the fire. Lodgepole pine was the primary species in this stand, and approximately half of the stand experienced moderate burn severity. It is likely that the fire killed most of the thin-barked lodgepole pine and reduced the live volume of the stand below the level required to meet the old-growth definition.

**Table 3.3-3:** Historic and Pre-fire Age Class Distribution (percent) by Analysis Area.

ANALYSIS AREA	AGE CLASS (years)			
	00 - 39	40 - 99	100 - 149	150+
<b>Bitterroot-Blackfoot Climatic Section (Historic)</b>	29%	29%	21%	21%
<b>Clearwater Unit (Pre-fire)*</b>	6%	28%	35%	26%
<b>Jocko Salvage Project Area (Pre-fire)</b>	4%	7%	35%	54%

\* Approximately 5% of the Clearwater Unit does not have current age class data available.



Stand structure characterizes stand development, disturbance and how a stand may continue to develop. Stand structure is classified as single-storied, two-storied, or multi-storied if there are one, two, or three main canopy layers, respectively. Single-storied stands are most often associated with stand replacement events, such as severe fires or regeneration harvests including clearcutting or seed tree cutting. Stands are fairly simple in vertical structure and are often even-aged. Regeneration harvests, such as a seed tree or shelterwood that retain 10% or more of the upper crown canopy and have a seedling/sapling understory, are considered two-storied stands. Two-storied stands have simple vertical structure and are frequently even-aged, although at least two age classes are generally present. The multi-storied condition arises when a stand has progressed through time and succession to the point that shade-tolerant species are progressing into the overstory. Three or more age classes may be present in these stands and vertical structure can be complex. These stands often experience a long interval between disturbances. Heterogeneous describes areas with various combinations of those structures in small groups throughout the stand. Uneven-aged stands have trees of various sizes distributed throughout the stand.

Prior to the fire, the project area was dominated by older age classes of multi-storied and uneven-aged stands. However, across the Clearwater Unit there is a more even distribution of the various stand structure types. Table 3.3-4 displays the proportion of the analysis area (forested portions only, prior to the fire) in each stand structure class for the project Area and Clearwater Unit.

**Table 3.3-4:** Pre-fire Proportion (%) of Analysis Area by Stand Structure

<b>Stand Structure</b>	<b>Jocko Lakes Salvage Project Area</b>	<b>Clearwater Unit</b>
Single-storied	2%	28%
Two-storied	3%	11%
Multi-storied	60%	23%
Heterogeneous	6%	25%
Uneven-aged	29%	13%

Past timber harvest has occurred on all sections within the project area. In the early 1990's, approximately 1.8 MMBF was harvested from about 220 acres within Section 16, and approximately 2.5 MMBF was harvested from about 363 acres within Sections 6 and 8. Northwestern Energy has easements for powerlines on Sections 8 and 16. Plum Creek Timber Company has an easement along a small portion of road within the north part of Section 16. There is currently a recreational use lease on Section 16 and a grazing license on Section 8. A flagstone/rock mineral lease removed approximately 60 tons of material from Sections 6 and 8 in 2007 (less than 1 acre).

No recorded threatened, endangered, or sensitive plant species were found in the analysis area (MNHP, 2007).

The recent fire changed vegetation cover type, density, and age class. Burn severity varied throughout the project area (Table 3.3-5). In areas that burned in low to moderate severity, density of live trees was reduced and species composition was likely shifted slightly towards fire-resistant ponderosa pine and western larch. In areas of high severity, where all trees were killed, the density of live trees was reduced to unstocked levels and stands are now in the youngest age class, 00-39 years. This increase in young stands shifted the project area age-class distribution toward what was historically present in the climatic section. At the larger scale, approximately 2,100 acres of DNRC lands managed by the Clearwater Unit were burned in the Jocko Lakes





Fire. This is approximately 4% of Clearwater Unit-managed lands. Similar to the project area, burn severity varied throughout the fire area.

**Table 3.3-5:** Estimated Burn Severity of Project Area (Within Fire Containment Line).

Burn Severity	Section 6	Section 8	Section 16
Unburned	8%	14%	5%
Low	16%	51%	20%
Moderate	16%	29%	39%
High	61%	6%	36%

Primary noxious weeds noted are spotted knapweed and thistle occurring as spot infestation on range and open timber sites. Noxious weeds also occur along access roads and present a risk of spreading onto state lands. Following the fire, soils where the duff was burned and bare soils exposed will all likely be at risk of weed encroachment from traffic, animals and wind vectors.

#### **No Action**

No harvest would occur at this time. Compared to the existing condition, no immediate changes would be expected. Some of the dead trees would likely be blown down. No forest improvement revenue would be generated to contribute to planting costs. Over time, conifer regeneration could establish in areas with a seed source and favorable microclimate. On adjacent lands, similar processes would occur.

Under the No Action Alternative, the risk of noxious weed spread is similar to the existing conditions and weeds are likely to increase on dry sites and within the fire area. The future management would likely be to treat knapweed as funding allows.

#### **Action Alternative**

Under the Action Alternative, DNRC would harvest and remove burned and live trees within the fire containment line. Changes to the vegetation would include an immediate reduction in density of live and dead trees on 65% of the project area (1,053 acres). In high severity areas (~628 acres), DNRC would harvest all merchantable timber except for selected snags and snag recruits. In the areas of lower burn severity and in 22 acres of unburned forest within the project area, harvest would emulate a shelterwood, retaining 10 to 45 trees per acre depending on aspect and availability. This stocking would vary given existing post-fire stand conditions (due to fluctuations in fire behavior in some areas and differences within species). Although many of the trees are currently green, many would most likely die within the next several years due to insect increases that prey upon stressed trees after the fire. Crown scorch, bole scorch, and crown kill would be used as indicators of the amount of head and stress experienced by the tree. Western larch, ponderosa pine, and vigorous Douglas-fir would be retained, in that order of preference. Compared to the existing (post-fire) condition, the general age class, structure, and cover type would remain the same. Within all burned harvest units, an average of 1 snag and 1 snag recruit per acre would be retained. These would favor western larch and ponderosa pine and be greater than 21 inches or the next largest size available. Additional smaller snags (15-21") would be retained at an average of 1 snag every two acres. In some cases, as in section 16, groups of snags would be retained in some areas to help achieve these snag numbers, whereas in other areas, less than the projected 1 snag, 1 recruit, and 0.5 snags per acre exist. Within some former harvest units, no re-entry would be made as harvest would be limited to a small number of stems and therefore volume per acre.



In the 36-acre potential old growth stand, any large live trees would likely be retained where available. While the old-growth definition may not be met due to the fire, large trees and snags would maintain some characteristics associated with the definition.

The greater portion of the drainage located in the southeast corner of Section 16 would not be harvested. Smaller portions in the northeast and the southwest corners of Section 16 would not be harvested as well. Other pocket wetlands and potential / probable streams would be protected and would have corresponding ERZ's and tree retention.

The area within the Buck Creek drainage would be harvested in such a manner to preserve a majority of all trees expected to survive this fire. It is estimated that 10% of the live green and healthy trees would be removed and these generally would come from skyline corridors and skid trails. Any skyline harvest near stream channels would require the skyline to be at least 50 feet away from the channel. This would help deter sediment moving down these trails into the above mentioned channels.

DNRC is in the process of assessing regeneration needs within the project area. DNRC would plant appropriate species for the site (western larch, ponderosa pine, and Douglas-fir) in high-severity burned areas. This planting would establish a new age class of conifer species within several years. Over time, western larch, Douglas-fir, lodgepole pine, and ponderosa pine would likely also become established through natural regeneration in areas with a seed source and favorable conditions. DNRC would continue assessing regeneration following harvest on a yearly basis and consider planting if natural regeneration does not occur.

At the larger scale, the proposed harvest in combination with other current and potential salvage projects would reduce stand density on less than 3% of the area managed by the Clearwater Unit. Over time, this project would slightly increase the component of seral species on the landscape as seedlings become established in burned stands.

Under the Action Alternative, the spread of noxious weeds would likely continue to occur throughout the fire area and could be exacerbated by timber harvest activities. As part of this project, DNRC considered an integrated approach to weed management as required by the County Weed Law with a focus on preventing noxious weeds and controlling spot infestations. DNRC would implement a combination of the following mitigations:

- ***Require cleaning of off-road equipment to prevent weed introduction.*** All road construction and harvest equipment would be cleaned of plant parts, mud and weed seed to prevent the introduction of noxious weeds. Equipment would be subject to inspection by the Forest Officer prior to moving on site.
- ***Treat noxious weeds along access roads with an emphasis on controlling new weed infestations.*** All newly disturbed soils on temporary road cuts and fills would be promptly reseeded to site adapted grasses to reduce weed encroachment and stabilize roads from erosion.
- ***Monitor the site for weeds as part of timber harvest contract administration.*** DNRC would monitor the project area for noxious weeds as part of on-going timber sale administration to identify if additional erosion control, grass seeding or weed control may be needed based on priorities to reduce erosion and restore the forest. If new noxious weeds occur following the harvest, a control plan would be developed and implemented that may include spot herbicide treatments. In cases where herbicides would be used, application would be done using a licensed applicator in accordance with label directions, State laws, and rules of the Missoula County Weed District.
- ***Promptly re-vegetate roads and landings to limit the possible introduction of noxious weeds into the project area.***

On DNRC lands, this combination of mitigations would likely result in reduced weed infestations and benefit more competitive native vegetation compared to the No Action Alternative.



### **3.4. Wildlife Analysis**

#### **3.4.1. Issues**

##### **3.4.1.1. Issues Eliminated from Further Study**

###### **Sensitive Species**

###### **Bald Eagles**

There is concern that the proposed action and resulting habitat alterations could create conditions that are detrimental to bald eagles. Bald eagles typically nest and roost in large diameter trees within 1 mile of open water. They are sensitive to a variety of human caused disturbances, ranging from residential activities to resource use and heavy equipment operation, among others (Montana Bald Eagle Working Group 1994). Bald eagle response to such activities may range from spatial and temporal avoidance of disturbance activities to total reproductive failure and abandonment of breeding areas (MBEWG 1994). While foraging, they typically perch within 500 m of shoreline habitat (Mersmann 1989); and roost in trees ranging in diameter from 12 to 39 inches and 49 to 200 feet in height (Stalmaster 1987). The nearest known bald eagle territory is located along the western shore of Seeley Lake, approximately 2 miles north of the Beaver Creek parcel. Due to the distance involved, vegetative cover, and topography, there would be minimal risk of direct, indirect, and cumulative effects to this species as a result of the proposed action.

###### **Peregrine Falcon**

There is concern that timber harvest activities would disturb nesting peregrine falcons. The nearest known peregrine falcon nest is located approximately 7 miles northwest of the scoped area. Thus, the proposed action would have minimal risk of direct, indirect, or cumulative effects to this species.

###### **Townsend's Big-eared Bat**

Townsend's big-eared bats occur in a wide variety of habitats, yet its distribution tends to be strongly correlated with the availability of caves and old mines for roosting habitat. Population concentrations occur in areas with substantial surface exposures of cavity forming rock, and in old mining districts (Pierson et al. 1999). This species is primarily a cave dwelling species that also roosts in old mine workings. It is a relatively non-migratory bat, for which no long-distance migrations have been reported. The Townsend's big-eared bat does not generally associate with other species in its roosts, particularly at maternity and hibernating sites. The generally accepted mitigations for this species (e.g., Pierson et al. 1999) recommend a 500 ft radius buffer around mine and cave entrances to minimize disturbance around roost sites. Much of the mining activity in which adits or mine shafts are used occur >0.75 mile from the project area. As a result, there would be low risk of direct, indirect, or cumulative effects to this species as a result of the proposed action.

###### **Coeur d'Alene Salamander**

There is concern that timber harvest activities could affect this species. This species requires waterfall spray zones, talus, or cascading streams. Such habitat occurs within the Jocko Lakes parcel (section 36 T17N R17W), but no activities would occur within this parcel. There are no known areas of talus, waterfalls, or splash zones within the



remaining affected parcels. Thus, the proposed action would have low risk of direct, indirect, or cumulative effects to this species.

### **Columbian Sharp-tailed Grouse**

There is concern that timber harvest activities could affect this species. The nearest known population of Columbian Sharp-tailed grouse occurs near Ovando, MT. Because of the distance involved, the proposed action would likely have low risk of direct, indirect, or cumulative effects to this species.

### **Common Loon**

The common loon is a fish-eating bird that breeds and nests on lakes and ponds. The nearest known nesting locations for loons are on Seeley and Salmon lakes. Because these areas are not connected through the stream network with the proposed project area, there is low risk of direct, indirect, or cumulative effects to common loons as a result of the proposed project and this species will not be analyzed further in this document.

### **Harlequin Duck**

Harlequin ducks require white-water streams with boulder and cobble substrates, as well as dense riparian vegetation. Such conditions do not exist within, or downstream of the analysis area. Thus, there would be low risk of direct, indirect, or cumulative effects to this species.

### **Mountain Plover**

There is concern that timber harvest activities could affect this species. The short-grass prairie habitats, or heavily grazed taller grass prairie habitats, required by this species are not present within the harvest area. Thus, the proposed action would have low risk of direct, indirect, or cumulative effects to this species.

### **Northern Bog Lemming**

There is concern that timber harvest activities could affect this species. The sphagnum meadows, bogs or fens with thick moss mats required by this species are not present within the harvest area. Thus, the proposed action would have low risk of direct, indirect, or cumulative effects to this species.

## **3.4.1.2. Issues Studied in Detail**

### **Endangered Species**

#### **Grizzly Bears**

The recent fire, timber salvage, and road construction could alter habitat or enable motorized access into areas that could be detrimental to grizzly bears.

#### **Gray Wolves**

The recent fire, timber salvage, and road construction could alter habitat or enable motorized access into areas that could be detrimental to gray wolves.

#### **Canada Lynx**



The recent fire reduced the abundance and availability of lynx habitat. There are concerns that timber salvage operations could further reduce lynx habitat or delay forest recovery for suitable snowshoe hare utilization.

### **Sensitive Species**

#### **Black-backed Woodpecker**

With the recent creation of black-backed woodpecker habitat by the Jocko Lakes fire, there is concern that salvaging burned timber, and the associated activities, would reduce the availability of habitat and disturb black-backed woodpeckers.

#### **Pileated Woodpecker**

Timber salvaging and associated activities could alter habitat or create disturbance that could be detrimental to pileated woodpeckers.

#### **Fisher**

The Jocko Lakes fire burned potential fisher habitat. There is concern that timber salvaging, and its associated activities, could further reduce fisher habitat availability.

#### **Flammulated Owl**

The Jocko Lakes fire burned potential flammulated owl habitat. There is concern that timber salvaging, and its associated activities, could further reduce flammulated owl habitat availability.

### **Big Game**

The Jocko Lakes fire burned approximately 36,000 acres, increasing sight distance through reductions in screening cover (e.g., seedlings, saplings, shrubs). There is concern that increased sight distance due to removal of burned trees, and increased road densities may increase big game vulnerability.

## **3.4.2. Affected Environment**

### **Endangered Species**

#### **Grizzly Bears**

Grizzly bears are the largest terrestrial predators in North America, feasting upon deer, rodents, fish, roots and berries, as well as a wide assortment of vegetation (Hewitt and Robbins 1996). Depending upon climate, abundance of food, and cover distribution, home ranges for male grizzly bears in northwest Montana can range from 60 - 500 mi<sup>2</sup> (Waller and Mace 1997). The search for food drives grizzly bear movement, with bears moving from low elevations in spring to higher elevations in fall, as fruits ripen throughout the year. However, in their pursuit of food, grizzly bears can be negatively impacted through open roads (Kasworm and Manley 1990). Such impacts are manifested through habitat avoidance, poaching, and vehicle collisions.

Approximately 36,000 acres burned in the Jocko Lakes fire, primarily at stand replacing intensity (approximately 26,390 acres; from Jocko\_barcode\_090207 BARC map, using gridcodes 3 and 4), approximately 6,293 acres at a medium burn intensity (gridcode 2), and approximately 3,327 acres in a low burn intensity (gridcode 1). Thus, the vegetative



landscape was altered by the fire. Grizzly bears are known to utilize the nearby Clearwater River riparian zone and the power line corridor that runs through the project area (MT FWP comments 7 September 2006 for the Hidden Bugs Timber Sale). Within a 1,062 square mile analysis area that surrounds the project area, there are approximately 1,368 miles of open road and 3,400 miles of total road (open or closed), for road densities of 1.29 miles of open road per square mile (simple linear calculation), and 3.2 miles of total road per square mile (simple linear calculation). Currently, within the parcels proposed for timber salvage (4 parcels, 2,247 acres total), there is an open road density of 1.7 miles of open road per square mile (simple linear calculation; 5.96 miles), and a total road density of approximately 5.03 miles of total road per square mile (simple linear calculation; 17.64 linear miles).

### **Gray Wolves**

There currently are no known wolf packs within a 15-mile radius of the project area (U.S. Fish and Wildlife Service 2006 Interagency Wolf Report; Weekly wolf reports <http://westerngraywolf.fws.gov/>). However, there are unverified sightings of a wolf pack in the Jocko River drainage, immediately west of the project area (Kent Laudon, Wolf Specialist, MT Fish, Wildlife & Parks, personal communication, 5 March 2007). Cover, and road and prey densities likely have some influence on wolves (road densities reported under grizzly bear). For cumulative effects analysis, the analysis area will be the same as that of the grizzly bear. Mule deer, white-tailed deer, and elk are known to use the area. Currently, no known wolf den or rendezvous site is located within 1 mile of the project area.

### **Canada Lynx**

Lynx are currently classified as threatened under the Endangered Species Act. In North America, lynx distribution and abundance is strongly correlated with snowshoe hares, their primary prey. Lynx foraging habitat has recently been characterized as having high horizontal cover, an abundance of shrub cover, large diameter trees during winter, and is typically in spruce-fir forest (Squires et al. 2006). Typically, lynx inhabit early- to mid-successional lodgepole pine, subalpine fir, and Engelmann spruce forest. For denning sites, the primary component appears to be large woody debris, in the form of down logs, root wads, and rock piles (Koehler 1990) surrounded by high horizontal cover (Squires et al. 2006, Squires and Laurion 2000, Mowat et al. 2000). These den sites are usually in mature, mesic forests on northeast aspects. Lynx also den along the edges of regenerating forests where trees have blown down into jackstrawed piles of woody debris (Squires et al. 2006, Ruediger et al. 2000). Lynx response to fire is anecdotal. Observations from the Boles Meadows fire in 2003 noted that a lynx whose home range was located within the boundary of that fire was displaced to the Bob Marshall Wilderness (J. Squires, USFS, personal communication, 10 September 2007).

A population of lynx is known to exist in the Clearwater River Drainage, near the town of Seeley Lake. Prior to the fire, lynx use was documented through winter tracking, summer aerial telemetry, and GPS-collar locations on section 36 T17N R17W (Jocko Lakes parcel), section 16 T16N R16W (Buck Finley), and section 36 T16N R16W (7/10 Split Timber Permit; J. Squires, USFS, personal communication, 11 September 2007). A 90% isopleth map was developed for a portion of this population based upon 2800 GPS and aerial telemetry locations from 75 lynx between 1998 and 2006 (J. Kolbe, MT Fish, Wildlife & Parks, e-mail, 23 February 2007), indicating where 90% of the locations approximate the area utilized by lynx. Overlaying the Jocko Lakes fire perimeter on the lynx 90% isopleth map, approximately 26,570 acres (15%) of the approximately 171,800 acre lynx area were burned at varying intensities in August and September 2007. Of the approximately 36,000-acre Jocko Lakes fire, the majority of the forest burned at stand replacing intensity (approximately 26,390 acres; from Jocko\_bar\_090207 BARC map), approximately 6,293 acres at a medium burn intensity, and approximately 3,327 acres in



a low burn intensity. As a result, lynx habitat was changed on USFS, Plum Creek Timber, and DNRC lands affected by the fire, and burned timber is being salvage logged on the private industrial grounds. Table 3.4-1 presents estimates of pre- and post-fire lynx habitat on the 5 parcels covered by the proposed action, and section 18 T16N R15W, which was also affected by the fire. Much of the “denning/mature foraging” and “denning” habitat that remained post-fire occurred outside of the fire perimeter.

**Table 3.4-1.** Estimated pre- and post-fire lynx habitat acreage on 6 DNRC parcels affected by the 2007 Jocko Lakes fire (DNRC SLI database 28 September 2006 release; Jocko Lakes BARC map 2 September 2007; M. McGrath, DNRC Wildlife Biologist, field observations, August through October, 2007).

<b>Lynx Habitat</b>	<b>Pre-Fire Acres</b>	<b>Post-Fire Acres</b>
Temporary Non-Lynx	234	1,264
Other	1,332	613
Young Foraging	0	0
Mature Foraging	284	21
Denning/Mature Foraging	143	142
Denning	186	139
<b>Total</b>	<b>2,179</b>	<b>2,179</b>

### **Sensitive Species**

#### **Black-backed Woodpecker**

The black-backed woodpecker is an irruptive species that forages opportunistically on outbreaks of wood boring beetles primarily in recently burned habitats, and to a lesser degree in unburned habitats. It is also considered to be a sensitive species in Montana. Although the black-backed woodpecker’s nesting and foraging requirements are thought to be tightly linked with burned areas, it does nest and forage in unburned forest in response to insect outbreaks (Hutto 1995, Bull et al. 1986). Burned forests tend to be used immediately after burns occur (approximately 1 - 5 years). Large, densely stocked non-salvaged stands with an abundance of trees greater than or equal to 12 inches dbh appear to provide the greatest benefit to black-backed woodpeckers for foraging and nesting. Black-backed woodpeckers are also found in green forests with high levels of insect activity (Goggans et al. 1989).

In recent years, wildfires in western Montana have created an abundance of potentially suitable habitat that will be available for black-backed woodpeckers at the landscape scale. Because of the close relationship of black-backed woodpeckers and wildfire, the analysis area was defined as a 50-mile radius surrounding the project area. Encompassing the project area, the approximately 36,000-acre Jocko Lakes fire burned primarily at stand replacing intensity (approximately 26,390 acres), with approximately 6,293 acres at a medium burn intensity, and approximately 3,327 acres in a low burn intensity. Thus, potential black-backed woodpecker habitat was created, primarily on USFS and DNRC lands within the fire perimeter. It is estimated that approximately 1,141 acres of black-backed woodpecker habitat were burned on the 6 parcels affected by the fire. Within the 50-mile radius of the project area, 179,103 acres burned on 27 large fires in 2003, and 211,380 acres have burned on 11 fires in 2007. Thus, with burned areas generally losing their utility for this species after 5 years, 2007’s fires have replaced the amount of acres burned in 2003.

#### **Pileated Woodpecker**

The pileated woodpecker is one of the largest woodpeckers in North America (15-19 inches in length), feeding primarily on carpenter ants (*Camponotus* spp.) and woodboring



beetle larvae (Bull and Jackson 1995). The pileated woodpecker nests and roosts in larger diameter snags, typically in mature to old-growth forest stands (Bull et al. 1992, McClelland et al. 1979). Due primarily to its large size, pileated woodpeckers require nest snags averaging 29 inches dbh, but have been known to nest in snags as small as 15 inches dbh in Montana (McClelland 1979). Pairs of pileated woodpeckers excavate 2-3 snags for potential nesting sites each year (Bull and Jackson 1995). Snags used for roosting are slightly smaller, averaging 27 inches dbh (Bull et al. 1992). Overall, McClelland (1979) found pileated woodpeckers to nest and roost primarily in western larch, ponderosa pine, and black cottonwood. The primary prey of pileated woodpeckers, carpenter ants, tends to prefer western larch logs with a large end diameter greater than 20 inches (Torgersen and Bull 1995). Thus, pileated woodpeckers generally prefer western larch and ponderosa pine snags > 15 inches dbh for nesting and roosting, and would likely feed on downed larch logs with a large end diameter greater than 20 inches.

The most abundant habitat types (Pfister et al. 1977) within the project area are the subalpine fir/twinflower, Douglas-fir/blue huckleberry, subalpine fir/beargrass, and Douglas-fir/snowberry types (Stand Level Inventory database). Within the project area, there are approximately 712 acres that are predominately ponderosa pine, larch, or Douglas-fir/ponderosa pine, with average stand diameter  $\geq 15$  inches dbh that would be considered suitable pileated woodpecker habitat, of which, approximately 628 acres were burned by the fire (SLI database). The cumulative effects analysis area will encompass the project area parcels and a 1-mile radius surrounding them.

### **Fisher**

The fisher is a medium-sized animal belonging to the weasel family. Fishers prefer dense, lowland spruce-fir forests with high canopy closure, and avoid forests with little overhead cover and open areas (Powell 1978, Powell 1977, Kelly 1977, Clem 1977, Coulter 1966). For resting and denning, fishers typically use hollow trees, logs and stumps, brush piles, and holes in the ground (Coulter 1966, Powell 1977).

Within the Jocko Lakes fire perimeter, there are approximately 1,930 acres of fisher preferred habitat types on School Trust and USFS parcels. Of these acres, approximately 892 acres occurred within the project area prior to the fire. Post-fire, approximately 350 acres of potential fisher habitat remain on the affected parcels, primarily outside of the fire perimeter on section 36 T16N R16W. The Montana Natural Heritage Database reports one fisher sighting 2 miles north of the Beaver Creek parcel (section 6, T16N R15W). No class 1 or class 2 streams flow through the affected parcels.

### **Flammulated Owl**

The flammulated owl is a tiny forest owl that inhabits warm-dry ponderosa pine and cool-dry Douglas-fir forests in the western United States and is a secondary cavity nester. Nest trees in 2 Oregon studies were 22-28 inches dbh (McCallum 1994). Habitats used have open to moderate canopy closure (30 to 50%) with at least 2 canopy layers, and are often adjacent to small clearings. It subsists primarily on insects and is considered a sensitive species in Montana. Periodic underburns may contribute to increasing habitat suitability for flammulated owls because low intensity fires would reduce understory density of seedlings and saplings, while periodically stimulating shrub growth. Prior to the fire, there were approximately 1,297 acres of flammulated owl preferred habitat types. However, the Jocko Lakes fire burned many of those acres, leaving approximately 770 acres post-fire, and largely outside of the fire perimeter, that may be suitable for flammulated owls.

### **Big Game**





Road access has been linked to hunter-induced elk mortality rates and population dynamics (Leptich and Zager 1991). Results of an elk mortality study in northern Idaho found that bull mortality rates were approximately 25% lower in areas with managed access, than in highly roaded areas, but were still approximately 40% higher than in areas with few roads (Leptich and Zager 1991). Additionally, Leptich and Zager (1991) found that closing roads extended the age structure of the bull population from 5.5 years to 7.5 years. However, the unroaded population had the most balanced bull age structure with some bulls living >10 years. Thus, road density and access management play important roles in big game population dynamics.

The area burned during the Jocko Lakes fire does not contain big game winter range. However, it is a mixture of private industrial forest (53%), National Forest (32%), Tribal (8%), and School Trust lands (6%). Within this area, there are approximately 249 miles of road, of which, approximately 135 miles are open to motorized access. On the affected parcels, there are approximately 20 miles of road, of which, approximately 7 miles are open to motorized access.

### 3.4.3. Environmental Consequences

#### Endangered Species

##### **Grizzly Bears**

**No Action:** Under this alternative, timber salvage would not occur throughout the affected area, and road construction would not occur on the Buck Finley parcel (Section 16 T16N R16W). Open and total road density would not change under this alternative; however there would likely be a gradual change in sight distance from open roads with burned snags falling over time. These changes would be most pronounced along the main Beaver Creek Road, approximately 0.6 miles on 2 roads in the Tupper's Lake parcel, and the approximately 1 mile of main road in the Jocko Lakes parcel, due to the abundance of high severity burn visible from these open roads. However, this increase in sight distance would be temporary until natural regeneration colonizes the affected sites and provides visual screening cover. Thus there would likely be low risk of direct, indirect, and cumulative effects to grizzly bears as a result of the no action alternative.

**Action Alternative:** The proposed action would salvage burned timber on 1,053 acres on 3 parcels: Beaver Creek (Section 6 T16N R15W), Tupper's Lake (Section 8 T16N R15W), and Buck Finley, and construct approximately 2.75 miles of new road on the Buck Finley parcel. Additionally, other DNRC actions analyzed under separate MEPA documents include approximately 34 acres of burned timber salvage in the 7-10 Split Timber Permit (section 36 T16N R16W), harvest of approximately 125 acres of bug-killed lodgepole pine and construction of approximately 0.5 mile of road in the Hidden Bugs Timber Salvage, salvage harvest of approximately 120 acres of burned timber in the Hidden Bugs Amendment, and construction and reconstruction of approximately 2.9 miles of road on the Beaver Creek parcel.

The proposed timber salvage on the Beaver Creek and Tupper's Lake parcels would increase sight distance on approximately 524 acres that are visible from open roads within the affected parcels, thereby potentially increasing grizzly bear vulnerability to poaching. However, the increased sight distance would be temporary, as the proposed action includes planting the burned acres on these parcels to reduce the time for forest regeneration. Additionally, roads that would be constructed under the proposed action, and roads constructed under the Jocko Salvage Road Work EA Checklist, would not increase the open road density within the project and analysis areas, and would install



road closure devices where necessary. However, the proposed road construction would increase the total road density from approximately 3.2 to 3.21 miles of road per square mile within the cumulative effects analysis area, and from approximately 5.03 to 6.64 miles of road per square mile within the affected parcels. With the installation of road closure devices, the risk of increasing motorized access within the project area should be minimized. As a result, there would likely be low risk of direct, indirect, or cumulative effects to grizzly bears as a result of the proposed action.

### **Gray Wolves**

**No Action:** Similar to the effects for grizzly bears under the no action alternative, effects to wolves would be linked to the gradual increase in sight distance associated with open roads and the gradual loss of snags over time. However, this increase in sight distance would be temporary until natural regeneration colonizes the affected sites and provides visual screening cover. Thus there would likely be low risk of direct, indirect, and cumulative effects to wolves as a result of the no action alternative.

**Action Alternative:** Similar to the grizzly bear analysis, there are multiple past, current, and proposed state actions that could potentially affect wolves. The timber salvage under this proposed action, as well as in the Hidden Bugs Timber Sale, proposed 7-10 Split Timber Permit, proposed Bugchuck Timber Salvage, Seeley Salvage I and II, and the road construction associated with the Jocko Lakes Fire Salvage projects could affect wolves through reduction in screening cover along open roads. Within the project area, the proposed action would minimize the loss of screening cover through planting seedlings post-harvest to accelerate forest regeneration, thereby reducing the time screening cover would be reduced in the harvest units. Additionally, through installation of road closure devices and construction of roads on currently closed road systems, open road density would not be increased through the proposed action. As a result, there would likely be low risk of direct, indirect, or cumulative effects to wolves as a result of the proposed action.

### **Canada Lynx**

**No Action:** Under the no action alternative, the proposed roads would not be constructed and the proposed timber salvage and tree planting would not occur. As a result, there would be an abundance of trees killed by the Jocko Lakes fire on the landscape. Eventually, these trees would fall and become coarse woody debris on the ground, and serve as subnivean cover for snowshoe hares, and potential den sites for lynx. Such sites would be most beneficial for lynx and snowshoe hares once natural regeneration has stocked the landscape with seedlings and saplings that would provide the desired cover for these two species. Thus, the additional downed wood would create habitat features for use by the lynx's primary prey, while also creating additional features for lynx use. As a result, there would likely be low risk of direct, indirect, or cumulative effects to lynx from the no action alternative.

**Action Alternative:** The proposed action, combined with actions covered under the Jocko Salvage Road Work EA Checklist, would construct approximately 5.7 miles of road on the Beaver Creek, Tupper's Lake, and Buck Finley parcels. There is concern that these roads would enable other predators, such as coyotes, to gain winter access to areas which lynx traditionally hunt without competition from other predators. Kolbe et al. (2007) found that coyotes in the analysis area: (1) stayed in lynx habitat having deep snow throughout the winter months; (2) used forest roads for approximately 10% of their winter travel; and (3) used snowmobile trails for approximately 8% of their winter travel distance and appeared to have minimal influence on coyote winter movements and foraging success. Thus, the proposed road construction would likely have minimal direct, indirect, or cumulative effects to lynx.



The proposed action would salvage timber on approximately 454 acres of the Buck Finley parcel, approximately 507 acres on the Beaver Creek parcel, and approximately 66 acres on the Tupper's Lake parcel. Additionally, other DNRC actions analyzed under separate MEPA documents include approximately 34 acres of burned timber salvage in the 7-10 Split Timber Permit (section 36 T16N R16W), harvest of approximately 125 acres of bug-killed lodgepole pine in the Hidden Bugs Timber Salvage, salvage harvest of approximately 120 acres of burned timber in the Hidden Bugs Amendment. Of the remaining 658 acres of suitable lynx habitat on the 3 affected parcels post-fire, the proposed action would retain approximately 478 acres post-harvest (Table 2). Within the 6 parcels affected by the fire, there are currently approximately 915 acres of suitable lynx habitat that would be reduced to approximately 647 acres following actions covered under all currently proposed actions (Table 3.4-2). Additionally, active timber salvaging is currently occurring on private industrial lands affected by the fire. To accelerate forest regeneration, planting would occur on the affected parcels, and would reduce the time lynx habitat types are temporarily unsuitable for lynx use. As per ARM 36.11.435(8), at least 5 acres of denning habitat and 10% of mature foraging habitat would be retained per parcel, where these habitats occur.

**Table 3.4-2.** Current and estimated post-action lynx habitat on 3 parcels covered under the proposed action, and on the combined 6 School Trust parcels affected by the Jocko Lakes fire, inclusive of the project area parcels. Cumulative action post-salvage acreage accounts for on-going and proposed state actions on the combined 6 School Trust parcels affected by the Jocko Lakes fire.

Lynx Habitat	Proposed Action		Cumulative Actions	
	Current Acres	Post-Salvage Acres	Current Acres	Post-Salvage Acres
Temporary Non-Lynx	926	1,106	1,264	1,537
Other	430	257	613	412
Young Foraging	0	0	0	0
Mature Foraging	21	14	21	14
Denning/Mature Foraging	142	142	142	142
Denning	65	65	139	74
<b>Total</b>	<b>1,584</b>	<b>1,584</b>	<b>2,179</b>	<b>2,179</b>

To mitigate the effects of the proposed action on lynx, the following would be implemented:

1. No salvage harvesting would occur within the Jocko Lakes parcel (section 36 T17N R17W). This would retain 140 acres of "other" habitat in an unharvested state, and 334 acres of temporary non-habitat that is largely standing dead timber and would eventually fall and create subnivean habitat for snowshoe hares and potential denning habitat for lynx. This parcel also received extensive use by lynx prior to the fire (J. Squires, USFS, personal communication, 11 September 2007).
2. A wildlife corridor would be retained in the northwest quarter of the Beaver Creek parcel to allow for wildlife movement, and is located in "other" lynx habitat.
3. Three to four 0.25 to 0.5 acre patches of lodgepole pine would be retained on the Buck Finley parcel for future snowshoe hare subnivean cover and planned blowdown areas for lynx denning structures.
4. Approximately 40 acres of "other" habitat and approximately 5 acres of mature foraging habitat would be retained in the northwest corner of the Buck Finley parcel.
5. Approximately 45 acres of "other"/mature foraging habitat within a riparian zone in the southeast quarter of the Buck Finley parcel would be retained.
6. Planting would occur within the project area to accelerate forest regeneration.



7. The portions of downed wood exhibiting decay (i.e., wood that could not be utilized) would be retained for snowshoe hare subnivean cover and potential lynx denning structures.

Given data available from local lynx researchers, the proposed action would attempt to leave the best available lynx habitat closest to areas that received extensive use by lynx prior to the fire. The proposed action would also be proactive at retaining lynx habitat features, and planning for future features. Heavier harvesting would occur on parcels that are lower in elevation and farther from pre-fire lynx use areas. Additionally, the project area parcels are typically surrounded by or adjacent to private industrial lands that are currently being salvage harvested. As a result, the proposed action would likely have low to moderate risk of direct, indirect, and cumulative effects to lynx.

### **Sensitive Species**

#### **Black-backed Woodpecker**

**No Action:** Under this alternative, burned timber would not be salvage harvested on the Beaver Creek, Tupper's Lake, Buck Finley, or Jocko Lakes parcels, and DNRC would retain approximately 1,091 acres of potential habitat for this species. Additionally, within a 50-mile radius of the project area, 179,103 acres burned on 27 large fires in 2003, and 211,380 acres burned on 11 fires in 2007. Thus, ample black-backed woodpecker habitat likely exists at the landscape level. As a result, there would likely be minimal risk of direct, indirect, or cumulative effects to black-backed woodpeckers as a result of the no action alternative.

**Action Alternative:** The proposed action would harvest approximately 573 acres on the Beaver Creek and Tupper's Lake parcels, combined, and harvest approximately 453 acres and construct approximately 2.75 miles of road on the Buck Finley parcel. This proposed action would harvest approximately 624 acres of potential black-backed woodpecker habitat on these parcels, while retaining several patches of habitat < 40 acres in area, primarily on the Buck Finley parcel. Additionally, approximately 319 acres of black-backed woodpecker habitat would be retained for this species in the Jocko Lakes parcel, where the single open road could potentially affect approximately 118 acres of habitat that is within 0.25 mile. On the 5 parcels affected by the Jocko Lakes fire that are covered by this analysis, approximately 1,884 acres burned. The proposed action would not salvage the 319 acres (17% of the burned area) of black-backed woodpecker habitat on the Jocko Lakes parcel, and approximately 201 of those acres would be relatively unaffected by the open road on the parcel. Thus, the proposed action would set aside 17% of the burned area for black-backed woodpeckers, which would include approximately 11% of the burned area that would be relatively unaffected by open roads. Within areas proposed for harvesting, the proposed action would also retain at least 1 snag and 1 snag recruit per acre whose DBH  $\geq$  21 inches, or the next largest available size class (as per ARM 36.11.411), and would retain 1 snag per 2 acres  $15 \leq$  DBH < 21. Should  $\geq$ 40 acre patches of black-backed woodpecker habitat exist within the parcels proposed for salvage harvest during the period of April 15 through July 1, mechanized activity would be minimized within 0.25 mile of said habitat (as per ARM 36.11.438(1)(a)). Thus, there would likely be low risk of direct and indirect effects to this species from the proposed action.

Actions covered under separate MEPA documents would salvage harvest approximately 73 acres and affect approximately 34 acres of black-backed woodpecker habitat. Additionally, surrounding private industrial lands affected by the fire are actively salvaging burned timber, while burned timber salvage is not currently proposed for nearby National Forest lands. Given the abundance of habitat burned within a 50-mile radius in 2007 and 2003, and the proposed management of habitat in the Jocko Lakes parcel in an



unharvested condition for this species, there would likely be a low risk of cumulative effects from the proposed action on black-backed woodpeckers.

### **Pileated Woodpecker**

**No Action:** Under this alternative, approximately 1,026 acres of burned timber would not be salvage harvested. As a result, there would be an abundance of snags on the landscape. However, because pileated woodpeckers have an affinity for stands with canopy closure that is greater than is generally available in the landscape, many of these burned stands would not be suitable nesting habitat for this species. Many of these snags would serve primarily as foraging substrate for pileated woodpeckers. As a result, this alternative would likely have minimal risk of direct, indirect, or cumulative effects to pileated woodpeckers.

**Action Alternative:** Within the project area, there were approximately 712 acres of potential pileated woodpecker habitat prior to the fire. Post-fire, approximately 84 acres remain. Under the proposed action, approximately 74 of the 84 acres would remain post-harvest. Proposed mitigations include retention of an average of at least 1 snag and 1 snag recruit whose dbh  $\geq 21$  inches (if not available, then the largest size class) would be retained per acre, under the fire salvage and likely future insect salvage (ARM 36.11.411). Additionally, the proposed action would retain 1 snag per every 2 acres whose  $15 \leq \text{DBH} < 21$  inches, and may plant seedling to accelerate forest recovery. Thus, with the harvest of approximately 10 acres of potential pileated woodpecker habitat, there would likely be low risk of direct or indirect effects. However, given that many of the affected parcels are immediately adjacent to  $\geq 2$  private industrial parcels, where fire salvage operations are currently on-going, and the reductions in habitat associated with the fire, there may be low risk of cumulative effects to this species from the proposed action.

### **Fisher**

**No Action:** Under this alternative, approximately 1,026 acres of burned timber would not be salvage harvested and trees would not be planted to accelerate forest regeneration. As a result, there would be an abundance of snags on the landscape that would eventually fall and become coarse woody debris. However, because fishers have an affinity for stands with canopy closure that is greater than is generally available in the landscape, many of these burned stands would not be suitable habitat for fishers for several decades. Thus, this alternative would likely have minimal risk of direct, indirect, or cumulative effects to fishers.

**Action Alternative:** The proposed action would harvest approximately 1,026 acres of burned timber and plant tree seedlings to accelerate forest regeneration on the Beaver Creek, Tupper's Lake, and Buck Finley parcels. The proposed 7-10 Split Timber Permit in section 36 T16N R16W would also salvage timber on 34 acres. However, the remaining unburned potential fisher habitat occurs outside of the fire perimeter on the Tupper's Lake and 7-10 Split parcels. Thus, the proposed action would not likely further reduce the amount of habitat currently available for fishers. Through salvaging burned timber, the proposed action would reduce the future availability of fisher habitat features (i.e., downed logs) on the affected parcels. To mitigate for some of these losses, the proposed action would:

1. Retain a wildlife corridor in the northwest quarter of the Beaver Creek parcel to allow for wildlife movement, and is located in fisher habitat types.
2. Three to four 0.25 to 0.5 acre patches of lodgepole pine would be retained on the Buck Finley parcel for planned blowdown areas for downed wood recruitment.
3. Retain approximately 45 acres of multi-storied habitat would be retained in the northwest corner of the Buck Finley parcel.



4. Approximately 45 acres of multi-storied habitat within a riparian zone in the southeast quarter of the Buck Finley parcel would be retained.
5. Planting would occur within the project area to accelerate forest regeneration.
6. The portions of downed wood exhibiting decay (i.e., wood that could not be utilized) would be retained for downed wood recruitment.

Thus, through no loss of additional potential fisher habitat, and implementation of the proposed mitigations, there would likely be low risk of direct, indirect, or cumulative effects to fishers from the proposed action alternative.

### **Flammulated Owl**

**No Action:** Under this alternative, approximately 1,026 acres of burned timber would not be salvage harvested and trees would not be planted to accelerate forest regeneration. As a result, there would be an abundance of snags on the landscape that would eventually fall and become coarse woody debris. Unfortunately, many of the snags would likely fall prior to forest regeneration and the generation of suitable forest structure for this species. Thus, this alternative would likely have minimal risk of direct, indirect, or cumulative effects to fishers.

**Action Alternative:** The proposed action would harvest approximately 30 acres of the remaining 770 acres of post-fire flammulated owl habitat types within the affected parcels. The majority of the remaining post-fire habitat on the affected parcels occurs outside of the fire perimeter on the Tupper's Lake and 7-10 Split Timber Permit parcel. With the proposed post-harvest planting, forest regeneration should be accelerated so that there may be forest structure available for flammulated owls within two decades. Additionally, proposed mitigations include retention of an average of at least 1 snag and 1 snag recruit whose dbh  $\geq$  21 inches (if not available, then the largest size class) would be retained per acre, under the fire salvage and likely future insect salvage (ARM 36.11.411), and 1 snag per every 2 acres whose  $15 \leq$  DBH  $<$  21 inches would be retained. Due to the minimal reduction in post-fire habitat, proposed post-harvest planting, and implementation of the proposed mitigations, there would likely be minimal risk of direct, indirect, or cumulative effects to flammulated owls as a result of the proposed action alternative.

### **Big Game**

**No Action:** Under this alternative, timber salvage would not occur throughout the affected area, and road construction would not occur on the Buck Finley parcel (section 16 T16N R16W). Open and total road density would not change under this alternative, however there would likely be a gradual change in sight distance from open roads with burned snags falling over time. These changes would be most pronounced along the main Beaver Creek Road, approximately 0.6 miles on 2 roads in the Tupper's Lake parcel, and the approximately 1 mile of main road in the Jocko Lakes parcel, due to the abundance of high severity burn visible from these open roads. However, this increase in sight distance would be temporary until natural regeneration colonizes the affected sites and provides visual screening cover. Thus there would likely be low risk of direct, indirect, and cumulative effects to big game vulnerability as a result of the no action alternative.

**Action Alternative:** The proposed action would salvage burned timber on 1,051 acres on 3 parcels: Beaver Creek, Tupper's Lake, and Buck Finley, and construct approximately 2.76 miles of new road on the Buck Finley parcel. Additionally, other DNRC actions analyzed under separate MEPA documents include approximately 34 acres of burned timber salvage in the 7-10 Split Timber Permit (section 36 T16N R16W),



harvest of approximately 125 acres of bug-killed lodgepole pine and construction of approximately 0.5 mile of road in the Hidden Bugs Timber Salvage, salvage harvest of approximately 120 acres of burned timber in the Hidden Bugs Amendment, and construction and reconstruction of approximately 2.9 miles of road on the Beaver Creek parcel.

The proposed timber salvage on the Beaver Creek and Tupper's Lake parcels would increase sight distance on approximately 524 acres that are visible from open roads within the affected parcels, thereby potentially increasing big game vulnerability to hunting. However, the increased sight distance would be temporary, as the proposed action includes planting the burned acres on these parcels to reduce the time for forest regeneration. Additionally, roads that would be constructed under the proposed action, and roads constructed under the Jocko Salvage Road Work EA Checklist, would not increase the open road density within the project and analysis areas, and would install road closure devices where necessary. However, the proposed road construction would increase the total road density from approximately 5.03 to 6.64 miles of road per square mile within the affected parcels. With the installation of road closure devices, the risk of increasing motorized access within the project area should be minimized. As a result, there would likely be low risk of direct, indirect, or cumulative effects to big game vulnerability as a result of the proposed action.

### **3.5. Historical and Archaeological Sites**

The route of a historic trail in Section 16, Township 16 N Range 16W, was identified and documented and will be formally recorded during the winter of 2008. Timber salvage activities are not expected to adversely affect this cultural resource (P. Rennie, DNRC, personal communication).

### **3.6. Aesthetics Analysis**

The Jocko Lakes project area is located within the Columbia Rockies character type of the Rocky Mountain Region. The landscapes in the general area are influenced by glaciation and steep glaciated peaks with lower rolling ridges that typify the area, and aesthetic kettle lakes (such as Hidden Lake and Tupper's Lake) are located along valley floors.

The rounded ridges that dominate the area are primarily covered with coniferous vegetation. This is a mixture of different conifers (ponderosa pine, western larch, Douglas-fir, lodgepole pine, etc.) with some hardwoods (black cottonwood, aspen, and willows) dispersed in the draws, seeps, potholes, and along the shores of bodies of water. South and west facing slopes in the area are often somewhat open. These areas are often covered by scattered coniferous vegetation and predominantly are a grass and brush community.

For the most part, the often visible checkerboard ownership pattern common in the Clearwater River drainages is readily apparent when looking at the project area. Although the area has seen a long history of timber removal, harvested ground varies from the form, line, color, and texture of the surrounding unharvested areas.

The project area has some "distinctive" landscapes: Seeley Lake, Placid Lake, Hidden Lake, Jocko Lake, and the Mission Mountain Tribal wilderness. Distinctive landscapes are those where the features of landforms, vegetative patterns, water, and/or rock formations are of unusual or outstanding visual quality.

This area was inventoried to determine its Visual Absorption Capacity or VAC. VAC is defined as the "physical ability of the land to support management activities and to maintain scenic integrity".



Factors that aid in determination of the VAC are: the natural forms, lines, colors, and textures; the distance between the project area and the viewpoints; the estimated number of viewers; and the relative sensitivity of those viewers to the scenery around them. The distance between the project area and the viewpoints is generally categorized into three groups; foreground viewing (distances from the viewer's position out to around 2 mile), middle ground viewing (distances from 2 mile to 4 miles from the observer), and background viewing (distances greater than 4 miles from the viewer's position). A subgroup of foreground viewing is the detailed feature landscape within the first few hundred feet of the observer.

Often slope impacts the amount of VAC by enhancing any changes in form, line, color, or texture. To paraphrase using simple terms - the steeper the slope, the lower the VAC. This means that a harvest prescription that is barely visible on gentle sloping ground can be highly visible when on steep ground. The proposed harvest area is generally foreground or middle ground viewing from much of the general area. Open roads coarse through the project area, and the sections of 6, 8, and 16 can be viewed from several distinct locations.

The visual resource analysis of this area was conducted by utilizing the Visual Management System (USDA 1977a, USDA 1977b, USDA 1980a, USDA 1980b), and the Scenery Management System (USDA 1995). Both of these were developed by the U.S. Forest Service and have been used to describe the existing conditions, effects of actions, and mitigations for projects. Information used in this analysis was gathered from field visits, analysis of photographs and seen area maps, and the study of landscape patterns in the area.

### **No Action**

Conditions within the general project area are the result of a large wildfire. As is common with such fires, the existing stands often do not show the true case of what trees will live or die for the next several years. As was studied by the DNRC on Trust Lands within the Bitterroot valley in 2000, some trees were still dying from primary fire effects (weakened root structures, inability to recover from crown reduction, etc.) and secondary fire effects (insects, windthrow, etc.) in the year of 2004. Fire affected stands within the Jocko Lakes fire area will likely show a similar breakdown over time.

Snags and open stand conditions would continue to occur. Many of the standing snags would likely fall over and create openings.

Over time, regeneration would fill in the open portions of the stand. These stands will continue to grow and assume form, line, color, and texture of the surrounding unharvested areas.

### **Action Alternative**

Under the Action Alternative, the creation of stand openings would be accelerated. The general number of trees left standing per acre would be less than the No Action Alternative. Harvest units would be different in line and texture than some surrounding stands. This would be mitigated by retaining unharvested portions within the units. The unharvested portions would help decrease the form, line, color, and texture differences from the middle ground viewing areas.

During harvest, the trails of equipment on the ground or skyline yarding trails would be visible and would likely be overgrown with vegetation within one or two years. Remaining slash would be scattered or burned within one year or covered by other vegetation within three years. Through the removal of burned timber, sites would be generally lighter in color post-harvest than can be seen currently.





Should some of the proposed units be harvested during the summer, the associated skidding and hauling would likely cause temporary dust clouds. Such clouds would be short in duration and would only occur during harvesting.

During harvest, activities would be quite audible. Depending upon conditions, equipment could be heard many miles from their location. The harvest of this volume would most likely be done within a few months, would occur during the general “work week”, and would be short in duration.

Changes to the scenery as a result of proposed action would be in addition to past timber harvests, road building, future fire activity, and management activities on other ownerships. Much of the surrounding areas (U.S. Forest Service, Confederated Salish and Kootenai Tribes, and some private non-industrial) would likely not be harvested at the same time period. Under the Action Alternative, treated stands would fill in over time and blend in with the existing mosaic of openings and dense areas on surrounding ownerships. Harvest activities would likely have low risk of direct, indirect, and cumulative effects to aesthetics in the area.

### **3.7. Demands on Environmental Resources of Land, Water, Air or Energy**

No measurable impacts are likely to occur under either alternative.

### **3.8. Other Environmental Documents Pertinent to the Area**

**Double Arrow Timber Sale** – In 1990, the DNRC completed the Double Arrow Timber Sale, harvesting approximately 2.5 MMBF from 362 acres in Section 6, and N1/2 Section 8, Township 16 North, Range 15W.

**Jocko Salvage Roadwork** - The DNRC is currently constructing new roads, reconstructing existing roads, and replacing road features within Section 6 of Township 16 North Range 15 West and Section 16 of Township 16 North Range 16 West. Specifically, the DNRC is constructing 1.5 miles of new road, reconstructing and maintaining 3.6 miles of existing road, and replacing 10 culverts that are at risk of flooding or loss due to fire effects, with larger culverts (DNRC 2007). Activities are expected to be completed during the fall of 2007.

**Previous Activities on Section 16, T16N, R16W** - In the early 1990's, approximately 1.8 MMBF was harvested approximately 220 acres within the section.

**7/10 Split Permit** – The DNRC is currently developing a proposed timber permit to salvage harvest approximately 34 acres of burned timber in Section 36 T16N R16W.

**Hidden Bugs Salvage Timber Sale and Hidden Bugs Timber Sale Supplemental EA** – Under the original timber sale, the DNRC was harvesting approximately 800 thousand board feet of dead, dying, and susceptible lodgepole pine from approximately 125 acres in Section 18, Township 16 North, Range 15 West. In addition to timber harvesting, the original activities also included approximately 4 miles of road maintenance, 0.5 miles of new road construction, and 0.25 miles of road abandonment. In August of 2007, the Jocko Lakes Fire burned approximately 140 acres of the original project area. Under the Hidden Bugs Supplemental EA, the DNRC proposed to harvest an additional 70 acres of partially and severely burned timber within Section 18. No additional road has been planned but some road maintenance is needed to meet Montana Best Management Practices. Approximately 5,000 feet of fireline will be used as a skid trail, then obliterated. DNRC will plant appropriate tree species in the burned area to supplement natural regeneration. Western larch, ponderosa pine, and Douglas-fir will be planted starting as early as the spring of 2009.

### **Lolo National Forest, Seeley Ranger District**



**Double Arrow Fuels Reduction Project** – The Lolo National Forest, Seeley Ranger District has completed approximately 50% of the thinning and handpiling on the Double Arrow Fuels Reduction Project on the northeast edge of the Double Arrow Ranch Land Owners Association properties in Section 5, Township 16 N, Range 14 W (P. Shelmerdine, Lolo National Forest, personal communication). They intend to start burning some handpiles later this fall and will most likely complete the rest of the project next year (2008). The project is in 4 units covering approximately 56 acres. The project includes thinning, handpiling and burning handpiles along the property line of the Double Arrow Ranch.

**Hidden Lakes Fuels Reduction Project** - The Lolo National Forest, Seeley Ranger District is currently thinning approximately 200 acres in Section 13 T16N, R16W. In addition to fuels reduction, the Ranger District is also constructing approximately 800 feet of temporary road that will be removed after harvest activities have been completed (T.E. Paulsen, Lolo National Forest, personal communication).

## **4. Impacts on the Human Population**

### **4.1. Human Health and Safety**

No measurable direct, indirect, or cumulative impacts on human health would likely result from this proposed action. Safety considerations and temporary risks would increase for the professional contractors working within the sale area, and possibly for public vehicle traffic on roads while log trucks are hauling. There are no unusual safety considerations associated with the proposed timber sale. The general public and local residents would not face increased health or long term safety hazards because of the proposed timber sale.

### **4.2. Industrial, Commercial and Agriculture Activities and Production**

Section 8 is currently leased for grazing by Montana FWP, and the recent fire temporarily reduced forage available. Over time, forage production would be expected to increase under either alternative.

### **4.3. Quantity and Distribution of Employment**

People are currently employed in the road building industry in the region. Due to the relatively small size of the timber sale, there would be no measurable direct, indirect, or cumulative impacts from this proposed action on employment.

### **4.4. Local and State Tax Base and Tax Revenues**

People are currently paying taxes from the road building industry in the region. Due to the relatively small size of the project, there would be no measurable direct, indirect, or cumulative impacts from this proposed action on tax revenues.

### **4.5. Demand for Government Services**

There would be no measurable direct, indirect, or cumulative impacts related to demand for government services due to the relatively small size of the project, the short-term impacts to traffic, the small possibility of a few people temporarily relocating to the area, and the lack of other projects in the adjacent area.

### **4.6. Locally Adopted Environmental Plans and Goals**

The DNRC operates under the State Forest Land Management Plan (SFLMP, DNRC 1996) and Administrative Rules for Forest Management (ARM 36.11.401 through 450, DNRC 2003). The SFLMP established the agency's philosophy for management of forested trust lands. The Administrative Rules provide specific guidance for implementing forest management projects.

### **4.7. Access to and Quality of Recreational and Wilderness Activities**



The Rich Ranch has a recreational use lease on Section 16 that will expire in 2009. While potential exists for recreational use, the recent fire may discourage use in the near term. Due to the context and intensity of the proposed action, no measurable direct, indirect, or cumulative effects to the current recreational use lease or other access and recreation are expected.

#### **4.8. Density and Distribution of Population and Housing**

There would be no measurable direct, indirect, or cumulative impacts related to population and housing due to the relatively small size of the project, and the fact that people are already employed in this occupation in the region.

#### **4.9. Social Structures and Mores**

No direct, indirect, or cumulative impacts related to social structures and mores would be expected under either alternative.

#### **4.10. Cultural Uniqueness and Diversity**

No direct, indirect, or cumulative impacts related to cultural uniqueness and diversity would be expected under either alternative.

#### **4.11. Other Appropriate Social and Economic Circumstances**

**No Action:** Grazing on the Section 8 would continue to provide annual revenue of \$200. In addition, the current Special Use Recreational License for Section 16 would continue to generate annual revenue of \$37 through the year 2009.

**Timber Harvest Alternative:** Revenue from grazing and recreation would continue. The timber harvest would generate additional revenue for the Common Schools Trust. The estimated return to the trust for the proposed harvest would be \$1,056,000 to \$1,452,000 based on an estimated harvest of 8 to 11 million board feet (MMBF) and an overall stumpage value of \$132.00 per thousand board feet (MBF) (\$22.00 per ton). Costs related to the administration of the timber sale program are only tracked at the Land Office and Statewide level. DNRC doesn't track project-level costs for individual timber sales. An annual cash flow analysis is conducted on the DNRC forest product sales program. Revenue and costs are calculated by land office and statewide. The most recent revenue-to-cost ratio of the Southwestern Land Office was 2.43. This means that, on average, for every \$1.00 spent in costs, \$2.43 in revenue was generated. Costs, revenues, and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return.



## **5. List of Preparers**

**Sarah Pierce – Forester, Clearwater Unit**

**Craig Nelson – Forest Management Supervisor, Clearwater Unit**

**Jon Hayes – Area Silviculturalist, Southwestern Land Office**

**Mike McGrath – Wildlife Biologist, Southwestern Land Office**

**Jeff Collins – Hydrologist / Soil Scientist, Southwestern Land Office**

**Sonya Germann – Planner, Forest Management Bureau**



## 6. Finding

### 6.1. Alternative Selected

The environmental assessment has analyzed and disclosed the potential environmental impacts of two alternatives:

1. Action Alternative; and
2. No Action.

I have decided to approve the Action Alternative, including all the mitigations and controls recommended in the environmental assessment. My decision is based on a thorough review of the environmental assessment and public comment. I have selected the Action Alternative because I have concluded that the proposed action will achieve the project objectives of a) mitigating adverse impacts from the fire; b) restoring the forest to its income-generating potential; c) capturing value of dead and dying trees and preventing future value loss; and d) generating revenue for the trust beneficiaries. In addition, I conclude that due to the designs, mitigations and controls integrated into the proposed action, the project objectives will be achieved in a manner that avoids significant adverse impacts to the human and physical environment. The proposed action has been developed through an appropriate process involving public participation and interdisciplinary methods.

### 6.2. Significance of Potential Impacts

I am satisfied that all pertinent resources and environmental values have been properly identified and studied through the project development process. Based on my review of the environmental analysis, I have concluded that the proposed action will not cause any significant adverse impacts – either direct, indirect, or cumulative – on the human and physical environment.

After a thorough review of the environmental assessment, I have concluded that

- 1) Compared to the existing condition and no action alternative, there will be low risk of effects to soils, watershed, and fisheries. (EA section 3.1)
- 2) There will be minimal risk of impacts to flammulated owl (EA section 3.4)
- 3) There will be low risk of impacts to grizzly bears, wolves black-backed woodpeckers, pileated woodpeckers, fisher, and big game (EA section 3.4)
- 4) There will be low to moderate impacts to Canada Lynx (EA section 3.4)

I find that there are no impacts that should be regarded as severe, enduring, geographically wide-spread, or frequent. Further, I find that the quantity and quality of the various resources, including any that may be considered fragile or unique, will not be adversely affected to a significant degree. I find in the proposed action no precedent for future actions that would cause significant impacts, and I find no conflict with local, state, or federal laws, requirements, or formal plans. In summary, I find that some adverse impacts are avoided altogether by means of project design, and that others are controlled and mitigated to the extent that they do not become significant.

### 6.3. Need for Further Environmental Analysis

I find that the environmental assessment (EA) is the appropriate level of analysis for the proposed action and that an environmental impact study (EIS) is not required.



Stephen J. Wallace, Unit Manager  
Clearwater Unit

Date: October 22, 2007



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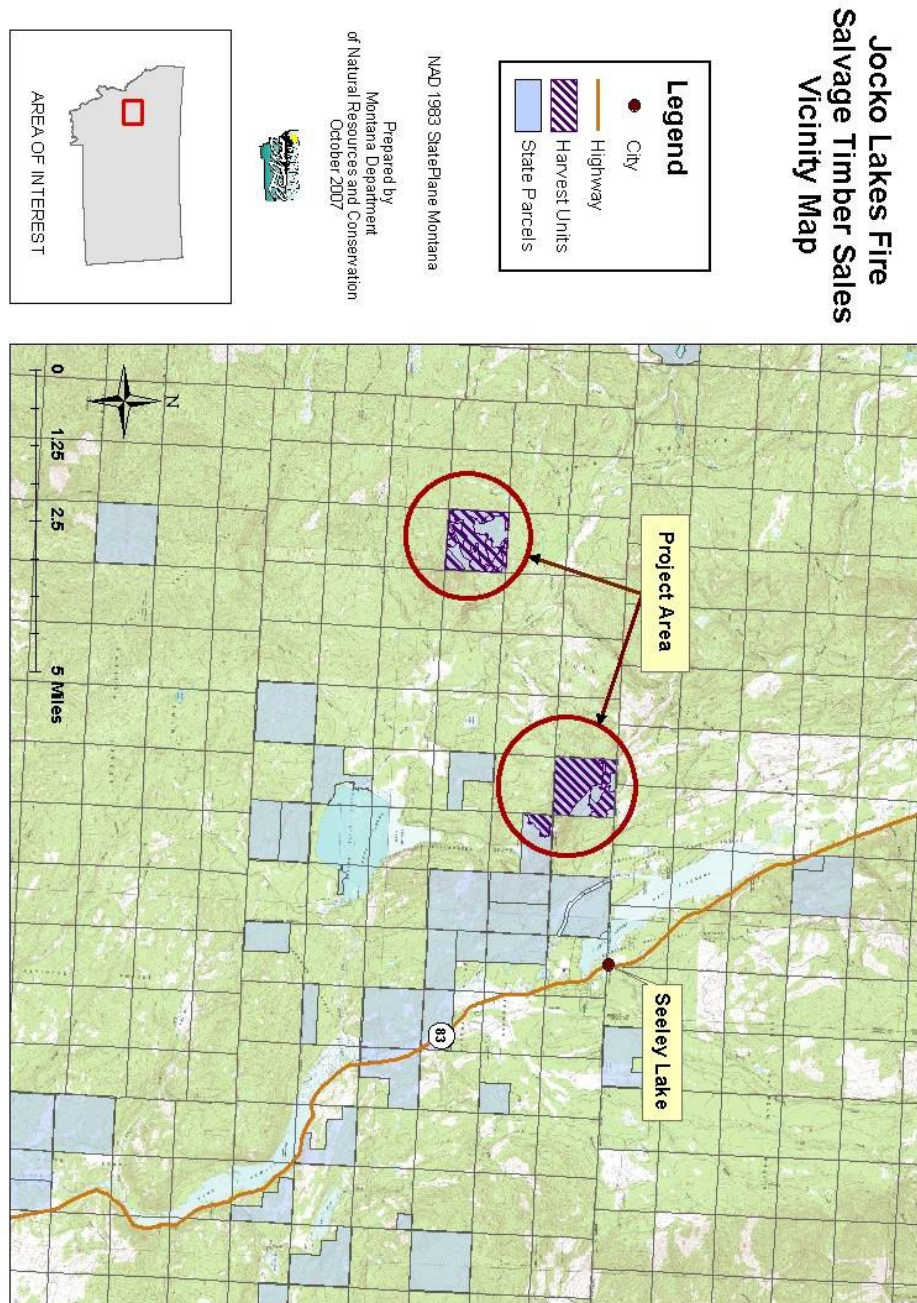
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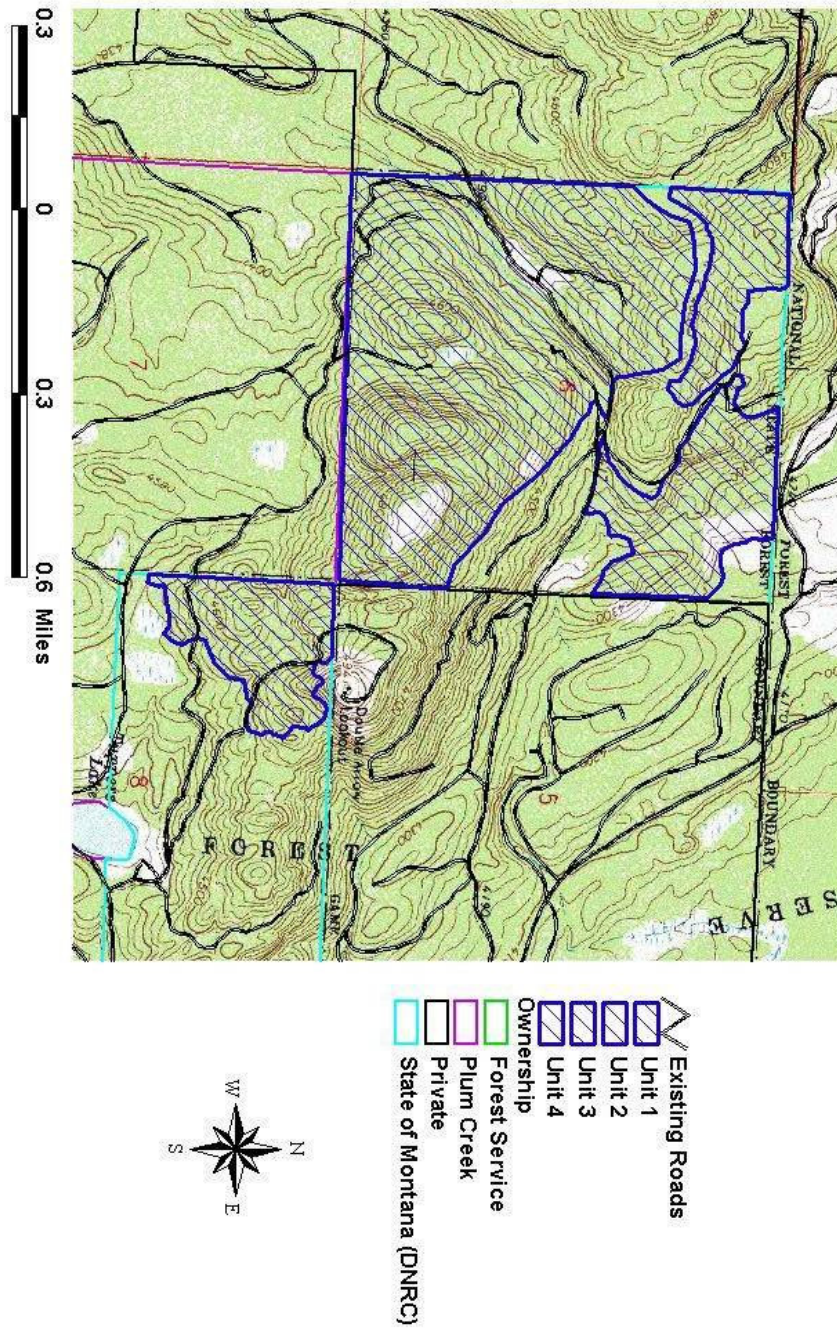
## 8. Appendix

### 8.1. Attachment A: Vicinity Map



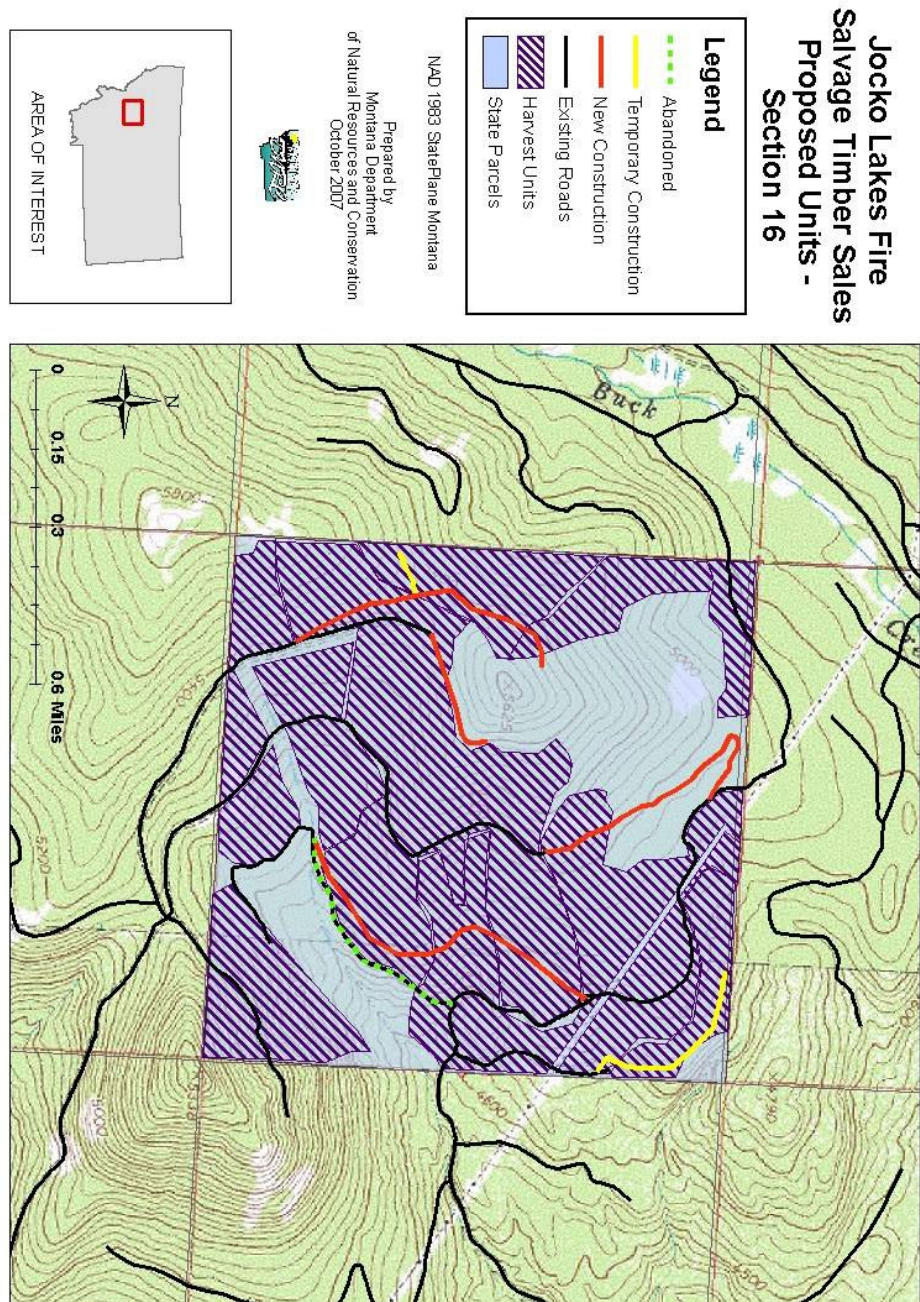
## 8.2. Attachment B: Project Area Map

### Proposed Units - Sections 6 and 8





### 8.3. Attachment C: Project Area Map



#### 8.4. Attachment D: Initial Proposal

September 10, 2007

#### Initial Proposal

#### Jocko Lakes Fire Salvage Timber Sales

The Jocko Lakes fire has burned over 36,000 acres of private, State, and National Forest lands.

Over 2,000 acres of these lands are State of Montana forested school trust lands. This area includes:

- Section 6 and part of Section 8 in Township 16 North, Range 15 West
- Section 16 and part of Section 36 in Township 16 North, Range 16 West
- Section 36 in Township 17 North, Range 17 West

The Montana Department of Natural Resources and Conservation (DNRC), Clearwater Unit, is planning salvage timber harvest and restoration work on State-owned lands within the fire area. Salvage timber harvest is being considered on Sections 6 and 8 in T16N R15W, and Sections 16 and 36 in T16N R16W. Other work would include erosion control, rehabilitation of streams and roads, grass seeding, and reforestation.

The primary objectives of the project are to:

1. Mitigate adverse impacts and restore the forest to its income-generating potential; and
2. Capture value of dead and dying trees and prevent future value loss.

Timber sold would generate revenue for the Common Schools and M.S.U. 2nd Grant Trusts. Estimated harvest volume would be eight to eleven million board feet, and could be sold as several sales or permits. Up to approximately six miles of new road would be built to access these stands, and additional roadwork may be required to meet Montana Best Management Practices. The proposed action could be implemented as early as the fall of 2007. In developing this project, DNRC will work with specialists in forest management, hydrology, soil science, wildlife biology and archaeology.

Montana DNRC is in the initial stages of planning, and we are inviting public comments and suggestions about this proposal. **Please send comments by September 26, 2007.** Please direct responses to:

Craig Nelson  
DNRC – Clearwater Unit  
48455 Sperry Grade Rd.  
Greenough, MT 59823-9635  
Email: [crnelson@mt.gov](mailto:crnelson@mt.gov)  
Phone: (406) 244-5857



**Montana Department of Natural Resources and Conservation**



**Clearwater Unit  
P.O. Box 48455 Sperry Grade Road  
Greenough, MT  
59823-9635  
(406) 244-5857**

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